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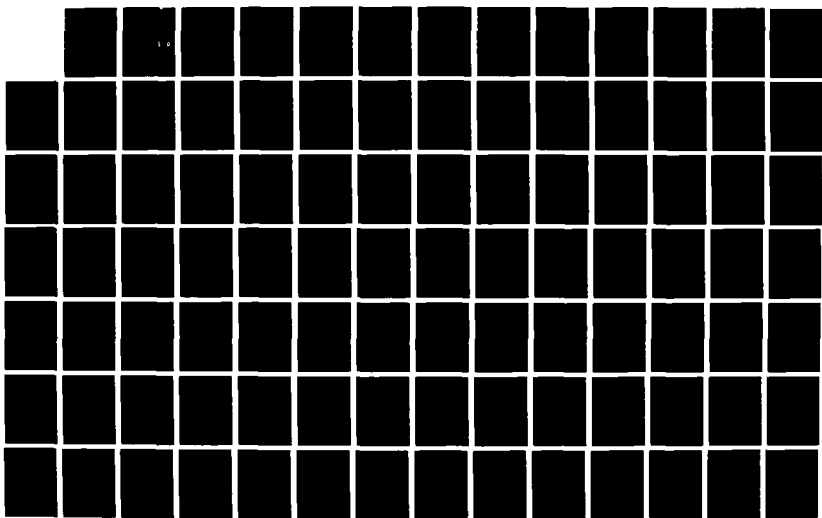
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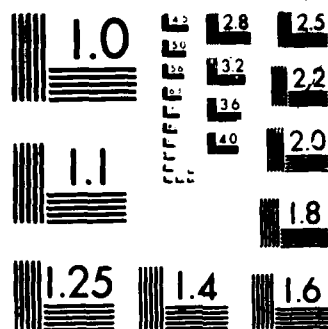
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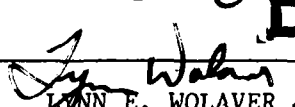
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Achievement and Retention of Spanish Presented  
Via Videodisc in Linear, Segmented  
and Interactive Modes

by

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Dedicated to my father

Achievement and Retention of Spanish Presented  
Via Videodisc in Linear, Segmented  
and Interactive Modes

by

Miguel Verano, B.A., M.A.

DISSERTATION

Presented to the Faculty of the Graduate School  
of The University of Texas at Austin  
in Partial Fulfillment  
of the Requirements  
for the Degree of  
DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT AUSTIN

May, 1987

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at the University of Texas were certainly instrumental in helping me finish "on time."

Last, but not least, my deepest gratitude goes to my family, who endured, understood, and stayed away during the writing process of this dissertation. All too often "Daddy" only stared at the computer monitor and paid little attention to everything else. Thanks to Robbie, my wife, and Sean and Willy, my sons, for their patience and support.

Achievement and Retention of Spanish Presented  
Via Videodisc in Linear, Segmented  
and Interactive Modes

Publication No. \_\_\_\_\_

Miguel Verano, Ph.D.  
The University of Texas at Austin, 1987

Supervising Professors: Mark W. Seng  
Wilhelmina C. Savenye

This study investigated the effects on achievement and retention of a beginning Spanish instructional videodisc entitled Zarabanda, presented over a two week period in linear, segmented, and interactive modes. Students ( $N = 92$ ) enrolled in a beginning Spanish course at the U.S. Air Force Academy were randomly assigned to three treatment groups and a control group. Group 1 ( $n = 23$ ), the linear videodisc instruction group (descriptive), watched the Zarabanda videodisc in a passive manner. Group 2 ( $n = 23$ ), the segmented videodisc instruction group (experimental), was presented the same material as Group 1 with the addition of inserted true/false and multiple choice questions at selected breakpoints in the story line. Students had

minimal feedback in the form of remarks such as "Correct" or "Wrong." <sup>A</sup>Group 3 ( $\underline{n} = 23$ ), the interactive videodisc instruction group (experimental), was presented materials in an interactive mode. The lesson was interrupted by the same questions at the same breakpoints as Group 2 with the additional benefit of feedback on incorrect choices, vocabulary lists, video replay and hint options for remediation, and explanatory statements on correct choices. ~~Group~~ Group 4 ( $\underline{n} = 23$ ), the control group, watched a videodisc in English that was totally unrelated to the material shown to the previous three groups. All students took a 40-item criterion based posttest. The same posttest, was administered to all groups one month later. In addition, all students completed pre/post experiment questionnaires.

Scores on the immediate and delayed posttests for the interactive instruction group were significantly higher ( $p < .0001$ ) than all other groups, as hypothesized. The results also indicated that the segmented instruction group scored significantly higher ( $p < .05$ ) than the control group on the immediate posttest, but not on the delayed posttest. Results of the post-experiment questionnaire showed that there were no significant differences between groups in attitudes.



In summary, interaction is most likely the factor that best accounts for the superior achievement results of Group 3, the interactive videodisc instruction group. The study supports learning theory research on the importance of involving the student in the learning process and gives credence to the claim that interactive videodisc is a viable medium in second language teaching/learning when materials are properly designed.

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## Chapter 1

### Introduction

#### Background of the Problem

By the late 1960s, enrollment in foreign languages began to decline, a problem which affected class size at all levels of instruction. Chomsky's new ideas about language struck the Achille's heel of Skinner's stimulus response learning. Feeling the social turmoil of the period, students pushed for courses they might judge "relevant." In response, many schools, colleges and universities dropped language requirements (Chastain, 1976). In 1966, 89% of all four year institutions of higher learning required foreign language study for the bachelor's degree, a figure which dropped to 53% in 1975 and to 47% in 1983 (Bennett, 1984).

This decline, and the partial loss of a "captive audience," (Primeau, 1979, p. 118) forced foreign language teachers to re-examine both curriculum and materials in the 1970s. Often, foreign languages were repackaged to be studied not only for their own sake, but also for their practicality and marketability. Many universities and colleges began to offer new majors, such as "Language and Business," or "Language

and Social Work" (Primeau, 1979). Some language departments responded by offering courses in which students used a foreign language as a tool to investigate problems in their own interest areas (Champagne, 1978).

Enrollment continued to decline in many foreign languages through the 1970s ("Fall 1977 Survey," 1978). (For some languages, that trend continues in the late 1980s). At the same time, Scholastic Aptitude Test (SAT) scores had dropped 49 points on the national level since 1963 (Primeau, 1979). Many looked upon the high school diploma as merely a certificate of attendance. Some high school graduates could hardly read (Sheils & Cook, 1975). Educators, politicians, and the general public began to demand "quality" in education--a move back to basics (Holtzman, 1970; Schulz, 1978).

Almost from the time of the arrival of computers in the schools, educators saw their power as tools capable of adapting to student needs, while at the same time helping to raise the quality of education. In a unique way, computers are beginning to help achieve that goal (Hendricks, Bennion, & Larson, 1983; O'Neal, 1983).

### Statement of the Problem

Mass communications media such as television, radio and teleconferencing have the capability of disseminating information across vast areas, or to distant locations, allowing the sharing of ideas and potentially making people more homogeneous. Surprisingly, society, especially the student population, is becoming increasingly heterogeneous. Add to this societal heterogeneity the plethora of individual learner variables and an immense number of conditions arises which affect the teaching/learning paradigm (Ferralli, A. & Ferralli K., 1986). Abboud (1970) observes that even among a supposedly homogeneous college population there are differences in students' ability to attain mastery of relatively simple verbal learning tasks which, in turn, creates many challenges for the teacher and which results in varied student performance. This problem is exacerbated when students have to learn foreign languages.

The "lockstep" approach, still a characteristic of mass education, becomes strained and less efficient as the spectrum of learner abilities widens and the information base expands. Slower students fall behind, whereas superior ones seldom reach their potential.



In the late 1960s and early 1970s, educators began to see individualization of the learning process as one of the most promising avenues to achieve quality in education (Adams, 1966; Allen, 1972; Bockman & Gougher, 1971; Bunderson, 1970; Holtzman, 1970; Jarvis, 1971; Mueller, 1971; Politzer, 1971; Steiner, 1970). Today, individualization of instruction remains a viable goal. However, a greater degree of student involvement during the learning process has become an even more important factor.

The importance of interaction.

Rosenbaum (1969) reports no more than four or five linguistic interactions between the teacher and each learner in a typical fifty minute language class of about fifteen students.

In an entire two semester first year course,  
. . . a student . . . will participate in no more than four or five hundred foreign language interchanges, a figure which may be less than the average number of interchanges made in a single day between two people using their own language. (p. 437)

"In education it is a maxim that 'involvement precedes interest'" (Abrams & Streit, 1986, p. 92). Edu-

cators recognize that there is a difference in the outcome of learning between students who are passive during instruction versus those who are active (Anandam & Kelly, 1981; Mahlios & Bromley, 1984; Schrupp, Bush & Mueller, 1983). Rivers (1987) asserts that "to promote interaction in another language, we must maintain a lively attention and active participation among our students" (p. xiv). Learning a foreign language requires a great deal of practice and interaction, both of which are essential (Crotty, 1984; Rivers, 1986; Rosenbaum, 1969; Schneider, 1976). In fact, of the two, interaction is probably the more important. According to Rivers (1987), "interaction implies both reception and expression of messages" (p. xiv). Rivers explains that "the give-and-take of message exchanges enables students to retrieve and interrelate a great deal of what they have encountered" (p. 5). Interaction, as it relates to computer-based instruction, entails a response by the learner to stimuli within an instructional program. That same program should be capable of adapting to the needs of the learner and the content of the lesson. Nelson, Ward, Desch, and Kaplow (1976) write that "interaction is perhaps the most effective teaching technique possessed by the human

teacher" (p. 30). "Interaction," as an instructional strategy, can be extended to the non-human teacher as well.

Bauer, Miller and Henry (1985) acknowledge that interaction with a computer is "software dependent." Although "interactive" instruction is not exclusively videodisc-based, DeBloois (1984) provides an excellent definition, envisioning a videodisc-based system with the following characteristics:

1. Users create unique lesson sequences based on their own interest and learning style by selecting from hundreds of pre-planned options.
2. As learners make selections, the system responds with appropriate feedback, instructional sequences or additional options to provide the user with materials appropriate to their [sic] (a) interest, (b) ability, (c) learning style preference, (d) pace, [and] (e) language.
3. Materials are encoded on the disc in a modular rather than linear form.
4. The lesson is created as the result of a genuine interaction between the learner and a

data base of visual, textual and audio cues recorded on optical and magnetic memory. (p. 189)

These four components all require careful planning and thought on the part of the lesson designer. Although the definition presented by DeBloois appears to be all inclusive, others include the concept of "quality of interaction" in their definition (Bork, 1982, 1983; Cohen, 1983; Rubin, 1984). For Bork, the type of input required of the student during the interaction is fundamental, including the method of analyzing this input, and what occurs in the program after the input. Bork insists that the quality of the instructional program produced is dependent upon the quality of interaction in the design of the program.

Jonassen (1985) classifies types of interaction and adaptation available to lesson designers.

The interactive dimension describes the way in which learners interact with an instructional program. . . . The adaptive dimension describes the way in which instructional programs may adapt to either the needs of the learner or to the content it is presenting. (pp. 15-16)

The concept of interaction holds both quantitative and qualitative aspects. Interaction can be measured, in part, by the quantity of student responses during a particular lesson. In addition, and perhaps more important, "it is also necessary to assess the type of response that is required and how the program manages the interactivity" (Cohen, 1983). Although breaking up an interactive lesson at various points is necessary, interaction should not mean interruption for the sake of creating an interactive environment within a lesson. Even though forced, interaction should not be mechanical and superficial but geared in such a way as to deepen the learner's level of cognitive processing.

Feedback becomes a very crucial part of interactive learning. Feedback gives the learner knowledge of whether the lesson objectives are being internalized. If the lesson is proceeding satisfactorily, why, or if it is not, why not? Many researchers agree that providing proper feedback after a learner has made a wrong response versus a correct one probably has the greatest impact on learning (Anderson, Kulhavy & Andre, 1972; Barringer & Gholson, 1979; Hartley & Lovell, 1978).

Remediation, a crucial part of interaction, is yet another important dimension of feedback. Remediation

provides the learner with the opportunity to choose a correct response after an incorrect choice has been made by guiding the student through the use of hints, replays or parallel items. Robinson et al. (1985b) report that providing graded hints or the immediate repetition of an item parallel to the one missed by a student during a computer assisted lesson has proved to be a great aid to the student in subsequently eliciting the correct response. Ideally, the student should be led to the correct answer as elegantly as possible by means of hints, parallel alternatives, or the repetition (or rephrasing) of just enough of the material in question to help the student arrive at the correct answer.

Many educators are striving to individualize instruction by taking into account a number of learner variables such as aptitude, learning style, psychological factors, etc., and by making students active participants during that instruction. Various ways have been devised to try to achieve individualization, including team teaching, non-graded mastery-based continuous-progress programs, or flexible scheduling. But a more direct and dynamic way of dealing with each student is needed. A tutor for each student is impracti-

cal and cost prohibitive. However, "videodiscs really come into their own as individualized viewing devices. The ability to manipulate and control the medium implies control by one individual; why not let it be the student?" (Schneider & Bennion, 1981, p. 33).

The power of the interactive videodisc.

Technology often provides the tools needed to achieve society's goals. However, much of the technology available to language educators--educational and closed circuit television, electronic classrooms, traditional language laboratories, 16-millimeter film and others--has been sorely lacking, for the most part, in one essential quality--interaction (Leonard, 1968).

One of the most promising developments in approximating the optimum level of interaction and at the same time providing individualization of instruction is the use of a computer interfaced with a videodisc player. Depending on the lesson design, this combination of computer and videodisc player termed "interactive videodisc," can display instructional video and present students with questions, vocabulary lists, video replays, hints, and explanatory statements, among others. An interactive videodisc system "is the synergistic marriage of visual capacity and the intelligence of

the computer" (McPherson, cited in Gold, 1982, p. 64). DeBloois (1982) clarifies further by saying that "an interactive videodisc system is not merely a merging of video and computer mediums [sic]; it is an entirely new medium with characteristics quite unlike each of the composites" (p. 33). This combination, termed "interactive" (or intelligent) videodisc, provides "opportunities for significant innovation in communication for education [which] are unlimited" (Leveridge, 1979, p. 230). Eastwood (1979) believes that interactive videodisc "holds the potential for developing into a powerful instructional system" (p. 303). Fowe (1985) calls it "the most powerful instructional tool . . . [available]" (p. 8).

DeBloois and Wooley (1981) find that the interfacing of the computer with the videodisc allows bits and pieces of instruction to be easily accessed so that materials can then be designed to address the heterogeneity of students. Rubin (1984) explains that perhaps one of the most exciting possibilities which the multiple option capability of interactive videodisc offers is that we can begin to approximate a natural conversation where the interaction consists of a series of



logical dependencies, that is, each successive utterance depends on preceding utterances. (p. 5)

Instruction via interactive videodisc can provide the student with the lucid presentation of material in large or small segments, natural speech, still visuals and motion sequences that are not disjointed and unrelated. Interactive videodisc allows for a more realistic setting so that the student can make use of all of the contextual components that the medium can provide (Rubin, 1984). But a portion of the road to the world of interactive videodisc lies unfinished.

The unfinished road to making interactive videodisc technology more available to educators remains the lack of software (Eastwood, 1979). Hardware development has surpassed the availability of software. But the development of software depends upon research that will point the way to the most effective strategies in helping learners reach higher levels of achievement. Software development depends upon research that will determine the viability of using interactive videodisc technology in providing the qualitative difference that many educators claim to be essential and yet find to be lacking in many classrooms--interaction.

Robinson (1985a) urges that "research is needed to determine the effects of interactive video programs on achievement in language learning" (p. 25). This study concentrates on the following two areas: (a) providing an increase in the general knowledge base on the effects of interaction on achievement and retention with specific interest in (b) second language learning. The research involves manipulating the levels of interaction in the presentation of a Spanish language instructional videodisc program. The following questions direct the thrust of the study:

1. What would be the effect on achievement scores, as measured by a criterion based posttest, (a) if questions were introduced between segments of a Spanish language instructional videodisc or (b) if the material were presented in an interactive manner, that is, with questions, feedback on incorrect answers, video replay and hint options, explanatory statements and vocabulary lists available to the student?

2. What would be the effect on retention levels, as measured by a delayed administration of the same criterion based posttest, if the procedures mentioned in the preceding question were followed?

### Definition of Terms

These definitions are included to clarify the terminology used in this study. The terms "intelligent videodisc" and "interactive videodisc" are used interchangeably in the literature. This study uses "interactive videodisc."

#### Interactive Videodisc.

A system comprised of a computer interfaced with a videodisc player which incorporates available software in the form of a computer-assisted instructional lesson with its accompanying videodisc, including glossaries, vocabulary lists, help screens, branching, etc.

#### Linear Videodisc Showing.

A non-interrupted presentation of instructional material via videodisc.

#### Segmented Videodisc Showing.

A presentation of instructional material via videodisc interrupted by questions at selected breakpoints in the story line. Only minimal feedback, that is, "Correct" or "Wrong," is provided to the student.

#### Interactive Videodisc Showing.

A presentation of material via videodisc interrupted by questions at selected breakpoints in the story line with the capability of offering the student

feedback on incorrect choices, vocabulary lists, video replay options and hints options for remediation, as well as explanatory statements on correct and incorrect choices before attempting the missed question again.

Computer Assisted Instruction (CAI).

Instruction, usually interactive, controlled by means of a computer without the benefit of video on magnetic tape or videodisc.

Academic Composite.

A numerical representation of a cadet's potential for success at the U. S. Air Force Academy derived from a combination of Scholastic Aptitude Test (SAT) scores, high school grades, athletic participation, and leadership positions.

Semesters of Spanish.

The number of semesters of prior (usually high school) Spanish study a student has had.

Software.

Programs that cause a computer to perform desired functions.

Hardware.

The physical devices that comprise a computer system.

### Theoretical Bases

Interactive videodisc has been heralded by many as an important new technology that will have a significant impact on education (DeBloois, 1984; Schneider & Bennion, 1981; Eastwood, 1979; Howe, 1985; Leveridge, 1979). This technology is capable of encompassing a great number of the tenets of well-established cognitive theories of learning and the latest research in second language learning and acquisition.

In 1965, Carroll recognized that we do not yet have either a good general theory concerning the conditions under which learning takes place, nor a general theory of language behavior that would enable us to select optimal components of a foreign language teaching system for any given case. (p. 278)

Although such a comprehensive theory does not yet exist, promising strides have been made which are helping educators to better understand the learning process.

Ausubel (1963), a leading cognitive theorist, indicates that the learning process is an active one. He values both frequent testing and giving of feedback

to confirm, clarify and correct learning. Ausubel also advises that some tasks (such as listening comprehension) are so difficult that it may be wiser to slow them down or break them down into smaller parts in order to make them more intelligible to the learner.

Ausubel displays great enthusiasm for modern technology and what it can do for educators. "Only computers are logistically capable of simultaneously manipulating all of the variables influencing individualized instruction" (Ausubel, Novak, & Hanesian, 1978, p. 387).

For all learners, Ausubel stresses that learning must be meaningful. Meaningful learning implies that the learner must treat the information as "meaningful," that is, worthy of attention and of value to one's knowledge of the world--knowledge referred to as "cognitive structure."

Robinson (1985a) advises that "speech which is authentic and meaningful will be better recalled and produced than speech which is not" (p. 7). Robinson et al. (1985b) further argue that material must be meaningful, and that it must be so within an integrated context. One way of providing the learner with meaningfulness within an integrated context is through

"'stories' from the lifestyle of the target linguistic community" (Javetz, 1986, p. 15). Javetz further asserts that providing stories is not only interesting and motivational to learners, but stories are a necessary input in reading or listening practice. By decoding and at the same time slowly studying content, learners can prepare themselves to comprehend more in subsequent encounters with second-language oral or written materials.

Other researchers have reshaped thinking on how language is learned or acquired. Krashen has made a significant contribution in the areas of second language learning/acquisition and developed several hypotheses, two of which, (the Monitor and the Input hypotheses) are briefly discussed below.

Krashen (1982) calls the Monitor that part of the learner's internal system responsible for the conscious processing of language. The Monitor is tied to the formal rules of the language and comes into play when the learner makes a conscious effort to correct language performance, that is, when the learner pays more attention to form rather than communication. In other words, the Monitor operates when conscious language learning takes place. Therefore, tasks in the class-

room that deal with form or linguistic manipulations versus those that focus on communication, require greater use of the Monitor. On the other hand, Krashen equates acquisition with a subconscious process, not unlike a child learning his/her first language. Krashen further points out that learners acquiring a foreign language focus on meaning rather than form. He and others (e.g., Rivers, 1979; Robinson, 1978, 1981, 1985a; Savignon, 1972; Stevick, 1976; Wilkins, 1976) suggest that second language instruction, should focus on communication rather than on the grammatical points of a language.

In his Input hypothesis, Krashen delineates certain parameters for the presentation of second language material to students. Krashen posits an  $i + 1$  formula to help explain the conditions necessary for second language acquisition to take place. First, second language input ( $i$ ) must be supplied in great quantities to the learner. Second, the input must be comprehensible to the learner, that is, the material must be recognizable, based on his/her world experience, and relatable to the learner's cognitive structure. Input slightly above ( $i + 1$ ) the learner's level of facile understanding, is thought to facilitate both acquisition and



learning. Linguistic data qualifies as comprehensible input when the material is embedded in such a pragmatically or communicatively rich context that the learner becomes less conscious of the fact that the message is coded in a foreign language (Krashen, 1982). The implication arises that linguistic data does not qualify as input without interaction. To achieve this interaction, language must be used as it was intended to be used: for communication (Lantolf, 1985). Finally, second language input must be challenging by going just beyond the learner's level of competence.

Differences of opinion exist as to how best to present foreign language materials to students in a learning environment. Current thought favors emphasis on communicative activities. Some theorists argue for de-emphasizing grammatical analysis, and practically doing away with drill and practice exercises (Krashen, 1982; Lantolf, 1985). Others argue that instruction should proceed by using grammatical analysis and drill and practice exercises in such a way that they aid communicative competence rather than act as obstacles or the focus of study (Robinson et al., 1985b; Horwitz, 1985).

Lamendella (1979) conducted studies on transcortical aphasia which support the claim that "there is rarely if ever transference from drills to natural language use" (p. 435). Lamendella demonstrated how patients with lesions in certain parts of the language centers of the brain cannot carry out a wide variety of pattern drill activities but are quite able to communicate. Patients, however, who have a lesion in another part of the speech center are capable of doing the pattern drills, but cannot communicate. Lamendella believes that these studies on transcortical aphasia suggest the existence of separate neurofunctional systems: one governing interpersonal communication, and another controlling intrapersonal cognitive information. Depending on the input received by the brain, that is, input focused on form (pattern drills, grammatical analysis, etc.), or input focused on communication, the different systems come into play independent of each other (Selinker & Lamendella, 1981). "When learners engage in pattern drills, they tend to disassociate [sic] such activities from higher level language processing" (Lamendella, 1979, p. 14). Lantolf suggests that "potentially successful CALI [Computer Assisted Language Instruction] programs would be those

which focus on content in a manner that is immensely interesting to the learner" (p. 230).

Robinson et al. (1985b) argue that educators should not debate whether or not to use drill and practice, but rather should ask "what kinds of drill and practice are most effective in foreign language instruction in general, and . . . what kinds . . . are most effective when the computer is used?" (p. 2). Robinson et al. suggest that the computer itself may be the tool needed to isolate independent variables that come into play in the classroom while at the same time help researchers find the best strategies to use with the computer.

Research, such as that conducted by Robinson et al. (1985b), also suggests that most discrete point items, grammatical analyses or drill and practice exercises, whether carried out in the classroom or with the computer, should be done within an integrated context, so as to form a communicative entity and not stand divorced from the thrust of the communication. According to Schneider (1986) people learn through practice. Pattern drills and grammatical analysis, therefore, are important in providing students with the necessary practice in producing language sequences, even if these

activities merely approach "pseudo-communication" (Rivers, 1976, p. 23). In effect, pattern drills and grammatical analysis help to establish a certain knowledge base that acts as a prerequisite to subsequent language acquisition. Such communication practice drills have been developed by Paulston (1970) and Palmer (1970).

Horwitz (1985) argues that merely providing great quantities of comprehensible input as espoused by Krashen is not sufficient for learning to take place in the classroom setting with some students. She explains the "need for higher levels of structure with lower CL (Conceptual Level) individuals" (p. 7). Conceptual Level is composed of cognitive complexity and interpersonal maturity. Low CL students tend to be very concrete in their thinking, have problems dealing with abstractions and tend to have a low tolerance for frustration. High CL students can handle abstractions more easily; are inquisitive, non-judgmental, and self-assertive. Structure is defined as the information load, the number of choices the student is expected to make. Horwitz states that "the more information and choices, the lower the amount of structure" (p. 6).

Hunt (1971) argues that a low structure learning environment, similar to the one espoused by Krashen is the best match for the high CL student; a highly structured environment is more appropriate for the low CL (more concrete) student. Horwitz (1985) postulates that not just high CL students might do well using modern instructional practices; rather communication-centered activities can be made accessible to all students by varying the amount of structure. This implies, of course, that low CL students would not do as well in the classroom by just being provided comprehensible input in large amounts.

Each contribution made by the researchers mentioned in the foregoing discussion on how to best present foreign language input to students in a learning environment forms part of a multifaceted strategy that can be employed in the presentation of materials. The overriding factor, of course, remains providing the student with the best possible strategies.

Bork (1982) summarizes the most pertinent theoretical approaches to learning by pointing to two concepts that consistently appear in the literature on learning theory. These two ideas are "that learning is best when the student plays an active role in the learning

process and that different individuals learn in different ways along a variety of dimensions" (p. 4). Computer Assisted Instruction (CAI) and interactive videodisc require active participation of the learner and can individualize instruction, as Bork recommends.

### Summary

Several factors bear on the problems facing foreign language educators. The decline in interest in foreign language study over the last two decades has challenged teachers to look for ways of improving the curriculum and the methodology used in teaching foreign languages. This search for excellence has resulted in many approaches to language teaching/learning. The heterogeneous nature of the student population presents a challenge to the traditional classroom's "lockstep" approach--a situation that can be greatly improved by the individualization of instruction. However, individualization entails taking into account myriad learner variables--an undertaking that has yet to be completely mastered. Additionally, many foreign language classrooms are still anemic when it comes to the one technique that can bring vigor into the learning process--interaction. Interactive videodisc, an approach to second language teaching/learning, can be

sufficiently eclectic and adaptive to infuse into the teaching/learning paradigm the two elements that can add dynamism to instruction--the active engagement of students through interaction, and the adaptation of material to each learner through individualization. Nevertheless, Clark (1983) warns that instructional methods, not just the media, are the agents which foster learning. Technology becomes a multiplier of ideas; it does not produce them (Gerlach, 1984). The medium only does what the lesson designer programs it to do.

#### Assumptions

Based on this discussion, the following assumptions seem plausible for the use of interactive videodisc in second language learning.

1. Interaction is an important factor in the learning and retention of a foreign language.
2. An interactive videodisc system is one of the most technologically advanced media that can provide interactive instruction for many components of language learning outside, but not divorced, from the traditional language classroom.

3. Interactive videodisc is a medium that can help foster more positive student attitudes toward the target language, people and their culture.



## Chapter 2

### Review of the Literature

#### Introduction

The literature in educational technology reveals that many educators are beginning to give considerable attention to the videodisc. The enthusiasm, drive and creativity of the few pioneers (Bunderson, 1981; Schneider, 1976; Schneider & Bennion, 1981) who saw the tremendous potential of interactive videodisc in its conceptual stage is now being carried by new voices. The new proponents of the medium are extolling its capabilities and exhorting educators to look at the possibility of using it in a wide variety of disciplines, including second language instruction (Clark, D., 1984; Ferralli & Ferralli, 1986; Gilkey, 1986; Glenn & Kehrberg, 1981; Gold, 1982; Howe, 1985; Levin, 1983; Parker, 1984; Pribble, 1985; Smith, M., & Andrews, 1985; Withrow, & Roberts, 1984). Most of the fears and apprehensions of the past toward the use of computers in education are beginning to disappear. The questions that arise most often now concern ways to make the best use of the technology (Brody, 1984).

Technological developments occur at a very rapid

pace; most offer encouraging possibilities as well as new challenges. These new technologies, including interactive videodisc, are providing educators with powerful tools to improve the quality of education. But because these technologies are developing so quickly, educators have barely begun to understand their full potential and to refine the software. Furthermore, research on the effectiveness and different strategies to be used with interactive videodisc is very limited. Writings which advocate and extoll the capabilities of the medium and what it can do for educators are far more numerous. Robinson (1985a) writes that "owing to the newness of the technology, it is not surprising that little research is available" (p. 25). Abrams and Streit (1986) note that "few studies have actually been conducted to validate or refute the bold claims made about interactive video" (p. 92). Much of the literature focuses on (a) explanations of the intricacies of the technology itself, (b) comparisons with other media, and (c) what interactive video can do for educators. Much more research has been carried out in Computer Assisted Instruction (CAI). Nevertheless, the small amount of data available on interactive videodisc, the relatively more abundant research in

CAI, and two early experiments done with traditional film are reviewed below.

#### Early Research with Film

Long before interactive videodisc technology, researchers endeavored to determine the optimal presentation mode when showing instructional film to students. A series of studies, commissioned by the U.S. Armed Forces, was conducted in the late 1940s and early 1950s by the then, Pennsylvania State College. Two of these studies are relevant to this review. In these studies, researchers working with traditional film found two interesting variables that influenced student achievement, and which are also important with interactive videodisc.

McTavish (1949) conducted a study to determine the increments in learning attributable to the showing of four films once, twice, three times and four times, to four groups of 319 college students. Pre/post multiple choice objective tests on content were administered as criterion measures. Results of the study indicated that showing a film twice resulted in "appreciably more learning, [whereas] showings after the first two contributed little more to learning" (p. 1).

Kurtz, Walter, and Brenner (1950) conducted a study entitled "The Effects of Inserted Questions and Statements on Film Learning." The investigation was designed to compare "six methods of teaching a body of factual material" (p. 1). Two films that differed in subject matter were used. Each film was presented in six different ways to a population of 3,039 tenth-grade students. The six experimental versions were broken down as follows:

- C1 - the base film, used as a control version.
- C2 - a repetition version, two prints of the base film spliced together and projected in continuous succession.
- PQ - a "persistent questions" version that had multiple-choice questions inserted at a "persistent" level - every 32 seconds, on the average.
- PS - a "persistent statements" version that had reinforcing statements inserted about every 32 seconds.
- MQ - a "medium questions" version that had inserted only every alternate question included in the "persistent

questions" version, or a question every 64 seconds, on the average.

MS - a "medium statements" version that had inserted every alternate statement included in the "persistent statements" version, or a statement about [sic] 64 seconds. (p. 6)

Results showed that "material was generally learned better when emphasized by either statements or questions than when it was shown once without emphasis" (p. 15). The results also showed however, that even though statements or questions aided learning, the material was learned almost as well by merely showing the film twice.

The insertion of questions and statements, and the repetition of visual images, which were found to be powerful aids in the learning process in these experiments, are also crucial elements of interactive videodisc learning. Interactive videodisc can make use of video replay capabilities as well as display questions and explanatory statements on demand and in a controlled fashion within an instructional program. (See "Interactive Videodisc Showing" in Definition of Terms, Chapter 1).

### Computer Assisted Instruction: Introduction

Interactive videodisc has been defined as a system comprised of a computer interfaced with a videodisc player. This definition includes a common denominator that is the core of CAI as well as interactive video--a computer. For that reason, and because the concept of interaction is an important element both in CAI and in interactive video, a review of the general findings in CAI with a focus on language learning is appropriate.

In the mid 1960s, researchers offered numerous reasons for including foreign languages as an optimum subject matter for CAI (Nelson, Ward, Desch, & Kaplow, 1976). With CAI, class sessions could be reduced with no detriment to learning; discrete point items seemed ideally suited for the medium; immediate feedback could be given to the student, and instruction could be paced (Nelson et al., 1976). But many programs merely automated poor teaching, whereas others were well conceived and developed, making them efficient and effective.

The majority of foreign language educators using early CAI fell into one of two camps: audio-lingual or cognitive code. Proponents of the audio-lingual approach argued that active practice was an essential element in computer programs and that frequent remedia-

tion was valuable in forestalling the learning of poor language patterns (Lantolf, 1985). Adherents of the cognitive code approach, on the other hand, argued that informing students of mistakes and analyzing these mistakes would heighten students' awareness of "principles underlying the correct structures" (Lantolf, p. 225).

A great deal of the early and more recent language learning CAI programs fall within several categories with some overlap. Many of the language learning CAI articles describe instructional programs that provide drill and practice exercises (Adams, 1969; Allen, 1971; Decker, 1976; Dobrian, 1977; Helm & McIver, 1974; Kalbouss, 1973; McEwen, 1977; Phillips, 1972; Purcell, 1974; Smith, P. D., 1976; Turner, 1970). These language learning programs generally emphasize discrete point items dealing primarily with grammar or vocabulary.

Other drill and practice CAI instructional programs focus more on the importance of individualizing instruction (Curtin, Clayton, Finch, Moor, & Woodruff, 1972; Manwell, 1973; O'Brien, 1975; Robinson, 1985b). The University of Illinois has used PLATO (Programmed Logic for Automatic Teaching Operations), a comprehensive instructional programming, authoring, and delivery

system, in the teaching of several languages. PLATO has been used in innovative ways for reading programs as well as for vocabulary and grammatical exercises (Curtin, Dawson, Provenzano, & Cooper, 1976; Grundlehner, 1974; Scanlan, 1971).

Development and testing of PLATO and TICCIT (Time-Shared Interactive Computer-Controlled Information Television, Brigham Young University), two computer based instructional systems, have had a great deal of influence on more recent efforts in CAI. Evaluations of both of these CAI systems have been carried out by the Educational Testing Service. The evaluation of PLATO has shown that there were no significant achievement effects except in mathematics, although students' attitudes toward PLATO materials in general improved over time. The results of the English language evaluation with TICCIT showed significant achievement effects greater than those in mathematics (Chambers, 1980).

The Chicago City Schools Project, begun in 1971, was designed to improve skills in mathematics and reading using PLATO and TICCIT projects in the inner city schools. "The average increase in reading ability in the schools was 5.4 months per pupil for each 10 months of regular classroom instruction" (Chambers, 1980, p.



336). PLATO and TICCIT based computer tutorials have increased the average to nine months' improvement for eight months of instruction.

Computer Assisted Instruction: Related Experimental Research

Some language learning CAI instructional programs have dealt with the writing system of a language (Abboud & Bunderson, 1971; Chen & Cheng, 1976). A landmark study is the CAI program in the Arabic writing system (Abboud & Bunderson, 1971). Over the years, this program has been perfected and is still in use at the University of Texas and other locations in the United States. The positive attitudes displayed by students after working with this program have been assessed via a questionnaire designed to capture their attitudes toward the program and its content. Results show that "students enjoyed the program [rating it 2.4 on a 3 point scale]," (p. 67). The questionnaire also revealed that students "found that it [the program] speeded up learning [2.5] and that it was interesting [2.4]" (p. 67). Students learning the Arabic writing system via CAI in 1970, outscored students learning the same material via programmed instruction in 1969. The mean total grades were 82.03 for the CAI group and

70.08 for the programmed instruction group. The results were statistically significant ( $p < .005$ ). Students using the CAI program finished in 40% of the time that it took the programmed instruction group.

Schaeffer (1981) conducted an experiment at the U.S. Air Force Academy with beginning college students of German which "investigated the effectiveness of structural and semantic computer practice across two levels of verbal aptitude" (p. 133). Schaeffer used the computer to provide "meaningful" practice. The program was designed in such a way that

a structural exercise could be accomplished based on knowledge of structure alone, while [sic] a semantic exercise could be successfully completed only through understanding the meaning of the item/problem. (p. 133)

A structural exercise could be accomplished without regard to meaning, whereas a semantic drill could not be accomplished unless the student understood the meaning of the item. For example, structural drills required the change of a sentence from the present tense to the present perfect tense. The semantic exercises required the selection of verbs or phrases from a

list and then the formulation of meaningful sentences in the present perfect tense.

Schaeffer concluded that "meaningful" practice does not necessarily depend upon interaction between people, but that the computer can offer the learner the vicarious experience of interacting with a human being. In contrast, Lantolf (1985) implies that Schaeffer's conclusion might have been viewed more positively had the medium of instruction been interactive video. The visual component of interactive video, unlike CAI, can be programmed in such a way that a more realistic and human-like effect can be achieved.

Using the computer as a research tool, Robinson et al. (1985b) investigated the effectiveness of organizing instructional materials in different ways in order to answer the following questions:

What kinds of exercises are most effective in foreign language instruction in general, and what kinds of exercises are most effective in foreign language instruction when the computer is used as a medium? (p. 17)

Robinson et al. (1985b) worked with a population of 83 junior high school students in their fourth semester studying Spanish. Students were presented

exclusively with Spanish instruction via computer for 45 minutes each day during a period of 10 days. Robinson et al. investigated six pedagogical hypotheses (P) and four answer-judging hypotheses (AJ). Each of the following hypotheses was tested individually on consecutive days during the 10 day period:

[Pedagogical hypotheses.]

P1. The provision of an integrated context for the introduction of discrete structural items will improve memory and subsequent learning of the items . . . .

P2. Practice in which the student is focused on the meaning of the material will lead to greater learning of structural items than will practice in manipulating the structures themselves, without reference to meaning . . . .

P3. Exercises containing material which refers to known others will be more effective than those referring to anonymous others. . . .

P4. Exercises containing material which personally involves the learner because of its emotional or humorous content will be more

effective than those with non-emotional material . . . .

P5. Students who are able to choose from a 'menu' of topics to provide the general context of the exercise will achieve the goal(s) of the exercise more than those who are not able to make such a choice . . . .

P6. Exercises which require students to draw inferences through problem solving and guessing will be more effective than those which do not . . . .

[Answer-judging hypotheses.]

AJ1. Student discovery strategies: feedback which actively engages students in discovering the correct responses as well as the source of their errors will be more effective than that which does not . . . : (1) feedback which provides explanations of errors or locates errors will be more effective than that which gives correct answers only; (2) feedback which provides a series of graded hints related to the particular item (i.e., provides progressively more information) will be more effective than that which either pro-

vides explanations of errors or locates errors only.

AJ2. Student control vs. program control: feedback which combines student controlled help and programmed or 'expert' feedback will be more effective than either student or program control, exclusively . . . .

AJ3. Implicit correction of errors will be more effective than explicit correction of errors . . . .

AJ4. Repetition at spaced intervals of items missed by students will be more effective than: (1) repetition of the same or parallel item immediately, or (2) repetition of all items missed at the end of the entire drill.

(pp. 17-18)

A pretest, daily tests and a posttest were administered in addition to a pre/post attitudinal questionnaire. The major finding of the study is that the experimental group, the group which had the benefit of the strategies delineated in the pedagogical and answer-judging hypotheses throughout the experiment, significantly outperformed the control group. The attitudinal questionnaire revealed there were no sig-

nificant changes in attitudes toward Spanish study, computers, or Spanish speaking people. However, "there was a significant post gain in integrative motivation for the group as a whole" (p. 29). In general terms, results showed that:

1. Material must be meaningful in the cognitive as well as the affective sense.
2. Instructional activities and feedback should be controlled so as to lead students to the answer.
3. Language material becomes more effective when presented and practiced in an integrated context, where meaning is the focus.
4. Students should be able to relate to the material in a personal way through self-reference or through known others.
5. Error feedback is enhanced by the use of graded hints or the presentation of parallel items leading the student to the correct answer.

#### General Conclusions About CAI

Smith (1985) reveals CAI research is now beginning to confirm CAI as an effective and efficient instructional system. Nelson et al. (1976) report that tests showed that students using CAI to learn a second language achieved as well or better than students using

traditional methods, and that CAI students had favorable feelings toward the medium.

Chambers (1980) provides an excellent overview of what the literature reveals concerning CAI in general.

1. The use of CAI either improved learning or showed no differences when compared to the traditional classroom approach (Alderman, 1978; Deignan & Duncan, 1978; Kearsley, 1977; Magidson, 1978; Murphy & Appel, 1977; Paden, Dalgaard, & Barr, 1977; Splittgerber, 1979; Taylor et al., 1974).
2. The use of CAI reduced learning time when compared to the regular classroom ("CAI helping," 1977; Deignan & Duncan, 1978; Kearsley, 1977; Magidson, 1978; Sakamoto, 1978; Splittgerber, 1979; Taylor et al., 1974).
3. The use of CAI improved student attitudes toward the use of computers in the learning situation ("CAI helping," 1977; Kearsley, 1977; Magidson, 1978; Murphy & Appel, 1977; Splittgerber, 1979; Taylor et al., 1974).
4. The development of CAI courseware following specified guidelines can result in portability and their acceptance and use by other



faculty ("The ABC's," 1979; "CONDUIT," 1979; Laurillard, 1977; McKenzie, Elton, & Lewis, 1978). (p. 336)

In a similar compilation of research results, Kulik, Kulik, and Cohen (1980) came to the following conclusions about CAI:

1. Computers benefited both high and low aptitude students.
2. Students showed more positive attitudes toward instruction and the subject matter.
3. Computer based instruction saved one-third the time required by more traditional methods.

#### Instructional Design Guidelines

Significant interest has been generated during the 1980s toward the instructional applications of interactive video. The emphasis has recently shifted from the capabilities of the medium to the more salient concerns of instructional design and cognitive processing considerations (Hannafin, 1985). In an attempt to provide instructional designers with guidelines for the development of interactive video, Hannafin (1985) outlines the following:

1. When imposing lesson control, interactive video lessons should be adaptive in nature to permit a greater level of individualization.
2. Criterion-based interactivity should be used to direct learner processing and to monitor on-going comprehension of intended learning.
3. Video stimuli should provide the primary instruction; the computer should manage and control instructional sequence decisions.
4. The fundamentals of good instruction are more likely to be appropriate to the design of interactive video than not; the processes included are more important than the technology per se.
5. The level of difficulty of the video-based lesson should be perceived by learners as challenging and as requiring considerable effort. (pp. 14-16)

Hannafin describes the following as areas where caution should be exercised in the design of interactive video:

1. The type, level and position of questions for interactivity will affect the type of learning.
2. In general, it is not advisable to transfer instructional control decisions to learners unless additional prompting is provided.
3. There is evidence to suggest that the more explicit the imposed organizational structure of the lesson, the greater the potential for conflict with individual learner schema.
4. Learning efficiency may suffer as a result of interactivity--especially under mastery-oriented conditions. (pp. 17-20)

#### Interactive Video Research in Non-Language Areas

Although Hannafin's guidelines are extremely helpful to instructional designers today, research with interactive video began before their publication. Interactive video witnessed its first serious research thrust in the early 1980s. "The Development of Living Things," a videodisc project produced by WICAT, Inc. in the late 1970s is considered to be "the first disc program developed for individualized interactive instruction" (Sigel, Schubert, & Merrill, 1980, p. 84). An

entire biology course has been taught using this videodisc in an interactive fashion. Bunderson (1981) conducted a study comparing interactive videodisc instruction in biology, using the videodisc just mentioned, versus classroom lecture and textbook instruction. Results of the study showed that students receiving interactive videodisc instruction scored significantly higher on posttests than students in a traditional lecture setting. Students preferred the interactive videodisc format over all other methods of instruction. In addition, the videodisc group averaged a 30% savings in study time over the traditional lecture group.

Another study comparing traditional lecture presentation with CDI (Computer-Directed Instruction), defined as computer controlled video, was conducted at the University of Arkansas in 1983. Boen found that students in the CDI group scored significantly higher on posttests than the traditional lecture group.

In an unusual experiment using videodisc, Ebner et al. (1984) divided 70 combat medic trainees into two groups. The subject matter for the study was the preparation and administration of an intramuscular injection. Both groups had a student to instructor

ratio of 14:1. One group received instruction in the manner in which it was normally administered. Any video material was shown in the traditional linear manner. The experimental group received instruction in the same manner. The only difference was that the experimental group had the benefit of video materials on videodisc. The videodisc was not computer controlled, but instructor controlled. Instructors were thoroughly trained on the use of the videodisc prior to the experiment. "The videodisc instructors saved three hours from the original schedule, completing the lesson in four hours rather than seven" (p. 28). On initial posttesting of both groups, there was no significant difference between them even though the videodisc group performed better. Delayed posttesting, however, showed the difference to be significant. The videodisc group saved time and responded more favorably to the learning experience than did the control group. "The videodisc subjects never showed fascination or curiosity--they seemed to accept the repetitive instant replay of segments on the television screen as something ordinary" (p. 28). Although the researchers do not mention it, one of the time saving factors may have been the capability of the videodisc to access those video materials

randomly and instantly which needed repetition. This capability probably facilitated learning to the point that instructors were then able to move ahead in the lesson. The capability to repeat segments of film instantaneously in this study appears to have been an important element in the learning process.

Abrams and Streit (1986) conducted a study comparing two methods of independent instruction in the teaching of basic photography skills--linear videotape (LV) and interactive video (IV). In this study, IV was computer controlled allowing branching and remediation. Results indicated that the IV group "recorded significantly and consistently larger achievement gains than did the LV group" (p. 93). Some of the factors that the researchers found to be important in IV's favorable outcome in this study were: the level of learner control, opportunity for feedback and review, preference for IV over traditional methods, and the challenge for IV students to do their best.

#### Interactive Videodisc Research in Foreign Languages

Wyatt (1984) finds "remarkably little work has been done in computer-interactive video for any language" (p. 249). Nevertheless, this limited research

generally supports claims made by advocates of the medium.

In a study conducted at the U.S. Air Force Academy, Schrupp, Bush and Mueller (1983) compared traditional methods of presenting German language video materials, not originally designed for language instruction, with an interactive videodisc program developed for that same material. Students in the interactive group were asked multiple choice questions at appropriate breakpoints in the film. The program included hints and video replay options. The beginning students of college German who were presented the material in an interactive fashion scored significantly higher on measures of achievement than those who watched the film in a linear and passive fashion.

Crotty (1984) conducted a study at the U.S. Air Force Academy comparing traditional classroom instruction in a beginning French course with an interactive videodisc French program. Materials were matched so that the classroom group was presented essentially the same information as the videodisc group. A 28-item criterion test was administered to a sample of 78 students. A user-satisfaction survey was administered to students at the end of the experiment. Crotty did not

find significant differences in achievement between the two different treatments based on the overall posttest scores, even though the videodisc group outperformed the traditional classroom group. However, the results of the cloze test, a section of the posttest, revealed that the videodisc group outperformed the traditional classroom instructional group at a statistically significant level. Results of the user-satisfaction survey indicated "very positive attitudes toward the videodisc learning system" (p. 53).

Another language related interactive videodisc study was conducted by Meléndez (1984) at Brigham Young University. Three sections of third year Spanish were divided into three groups. One group was shown the film Macario and encouraged to discuss it for an hour as was normally done in the third year Spanish course. A second group was shown the film in its entirety and then allowed to work in small groups for 2 1/2 hours on an interactive videodisc program dealing with the film. The third group worked with the interactive videodisc program first, and then watched the film in a linear fashion. Results showed that the second group, those who saw the linear presentation of the film first, and



then the interactive videodisc program, "benefited most from the program" (p. 601).

### Summary

The research evidence available in CAI, in addition to the generally positive results beginning to accumulate in favor of interactive videodisc instruction, portend a very promising future for the use of technology in foreign language teaching and provide ample justification for the continuation of research in these areas. The attention to detail and careful design that are necessary to develop a successful lesson using the technology are two factors which help teachers improve their effectiveness. One may postulate that classroom instruction and student achievement may benefit from the process. As Ellis puts it, "thinking about the computer's role in education does not mean [merely] thinking about computers, it means thinking about education" (cited in Barstow, 1979, p. 116).

### Research Hypothesis

Based on the foregoing discussion, one may test the following null hypothesis: there will be no statistically significant difference in achievement scores or retention levels, as measured by a criterion based

posttest consisting of true/false and multiple choice items, attributable to the amount of interaction during instruction in the following groups: (a) segmented Spanish language instructional videodisc group, (b) interactive Spanish language instructional videodisc group and (c) control group.

Additionally, a linear Spanish language instructional videodisc group will be included. The purpose of introducing the linear videodisc group is to offer a descriptive rather than an experimental comparison which reflects a traditional approach to film presentation in foreign language classrooms.

## Chapter 3

### Study Design and Procedures

#### Population and Sample

This study was conducted at the United States Air Force Academy in Colorado Springs during the Fall semester, 1986. Ninety-two students enrolled in a beginning Spanish course at the U.S. Air Force Academy, Spanish 131, comprise the experimental sample. Table A-1 (Appendix A) summarizes the characteristics of these students.

Students had an average of 1.68 semesters of high school Spanish. The mean Academic Composite, a numerical portrayal of a cadet's potential for success at the U.S. Air Force Academy derived from a combination of Scholastic Aptitude Test (SAT) scores, high school grades, athletic participation, and leadership positions, totaled 3,053 out of an approximate possible high score of 4,000. The Academy places students in the beginning course if they score below a predetermined level on a comprehensive Placement/Validation (PLAVAL) Examination for Spanish, administered within the first few days of the students' arrival, or if they have no prior Spanish instruction.

Five factors contributed to the selection of this population sample and the location of the experiment. First, the material used in the study was specifically aimed at the beginning level student. Second, although standardization of materials and methods of instruction exists for all Spanish 131 classes at the Academy, this population sample forms a heterogeneous entity. Students come from geographically diverse areas as well as different socio-economic standings. This heterogeneity provides a wide base of language learning experiences and attitudes. Third, the military nature of the Academy provided the investigator with a captive audience, thereby facilitating the retention of the complete sample. Fourth, the Department of Foreign Languages has been involved in related research for a number of years. The Department offered to provide programming expertise and laboratory space to conduct the experiment. Sony Corporation provided the necessary hardware, including microcomputers and videodisc players. Fifth, foreign language classes are "capped" at 12-15 students, making them ideally suited for second language teaching/learning.

### Experimental Design

In the experimental design used for this study, students were randomly selected from the seven sections of the basic Spanish course, then randomly assigned to a group included for descriptive purposes, one of two experimental groups or a control group. More specifically, a variation of the randomized control-group posttest only design (Isaac & Michael, 1985, p. 69) was implemented as shown in Figure 1.

	<u>Treatment</u>	<u>Immediate Posttest</u>	<u>Delayed Posttest</u>
Descriptive (R) Group 1 ( $\underline{n}$ =23)	$X_1$	$T_2$	$T_3$
Experimental (R) Group 2 ( $\underline{n}$ =23)	$X_2$	$T_2$	$T_3$
Experimental (R) Group 3 ( $\underline{n}$ =23)	$X_3$	$T_2$	$T_3$
Control (R) Group ( $\underline{n}$ =23)	$X_4$	$T_2$	$T_3$

(R) = Random Assignment

Figure 1. Variation of the randomized control-group posttest only design.

The instructional video material used in the experiment was in the form a videodisc containing edited versions of the first two lessons of Zarabanda, a film series for instructional television in Spanish developed by the British Broadcasting Corporation. The

instructional films provide aural and visual stimuli complemented by a dramatic story line. The language used in the series is authentic and instructional. The independent variable, the manner of presentation of instruction (variations in the levels of interaction) via videodisc, consisted of three different levels and a control group. Twenty-three students were assigned to each of the following four groups, for a total of 92 students, as follows:

1. Group 1 - Linear videodisc instruction group (descriptive). The Zarabanda videodisc was presented in a sequential fashion, (no responses required of the student, passive mode, no interaction).

2. Group 2 - Segmented videodisc instruction group (experimental). The Zarabanda videodisc was interrupted by objective true/false, multiple choice questions at selected (end of scene, change of topic) breakpoints in the story line. Students responded to questions by keystrokes on the microcomputer during the lesson. Students only had minimal feedback in the form of remarks such as "Correct" or "Wrong," (minimal interaction).

3. Group 3 - Interactive videodisc instruction group (experimental). The Zarabanda videodisc was

interrupted by the same objective questions at the same selected (end of scene, change of topic) breakpoints in the story line as that of Group 2. In addition, the program had the capability of offering students feedback on incorrect choices to the questions, vocabulary lists, video replay options and hint options for remediation. Students responded to questions by keystrokes on the microcomputer during the lesson. The program also provided explanatory statements on correct choices, (maximum amount of interaction within the design of this experiment).

4. Group 4 - Control group. The material presented to this group was in English and was totally unrelated to the material presented to the previous three groups. By administering the posttest to this group, the investigator obtained information that would normally be derived from the administration of a pretest, but that in this experiment would have prejudiced the results.

The dependent variable, a test consisting of 40 items, measured the effects that the different treatments had on each of the four groups. The same test, (given four weeks later), measured how each of the groups retained the material. Questionnaires were

administered to measure pre/post experiment attitudes toward technology, the target language, and people and their culture, as well as the instructional materials themselves. The questionnaires were developed by the Center for Language and Crosscultural Skills and by the U.S. Air Force Academy (Appendices B and C).

The Zarabanda material, or anything dealing with the study, was not discussed during the experiment proper nor during the period between the immediate and delayed posttests. Furthermore, cadets are traditionally bound by an Honor Code that has been in existence in various forms since the Academy's beginning. Failure to comply can result in disciplinary action and/or dismissal from the Academy. By reminding cadets of the Honor Code and by giving them a military order both verbally and in writing (Appendix D) not to discuss any portion of the experiment with anyone, the possibility of compromising or influencing the results of the experiment, the questionnaires, or the criterion test was avoided.

Classes at the Academy are organized around an "M" and "T" day cycle. The first class day of the semester becomes an "M" day, and the second day becomes a "T" day. This cycle continues to alternate throughout the



semester. Figure 2 shows the course of events throughout the experiment:

	Mon	Tue	Wed	Thurs	Fri
A u g u s t	"T" 18	"M" 19	"T" 20	"M" 21 Pre-Exp Question naire	"T" 22 Pre-Exp Question naire
	"M" 25 First Lesson	"T" 26 First Lesson	"M" 27 Second Lesson	"T" 28 Second Lesson	"M" 29 Third Lesson
S e p t e m b e r	Labor day 1	"T" 2 Third Lesson	"M" 3 Fourth Lesson	"T" 4 Fourth Lesson	"M" 5 Posttest
	"T" 8 Posttest	"M" 9 Post-Exp Question naire	"T" 10 Post-Exp Question naire	"M" 11	"T" 12

Figure 2. Calendar of events during critical periods of experiment.

#### Instruments

The criterion measure (dependent variable) consisted of a 40-item posttest with 10 true/false and 30 multiple choice questions (Appendix E). The Department of Foreign Languages at Purdue University developed 18 of the 40 questions. These questions have been administered to students at that institution for several years. The investigator developed the remaining 22 questions which were either variations of other ques-

tions created by Purdue University or completely new ones. Reliability of the measurement instrument was determined by a coefficient Alpha reliability procedure yielding a coefficient of .78. All students took the immediate and delayed posttests in their normal classroom using a test booklet and digitek answer sheet (an answer sheet requiring a No. 2 pencil for marking and scored by an optical scanner).

Content and face validity for the criterion test can be inferred by comparing the behavioral objectives with the questions in the instrument. The behavioral objectives for the instructional material follow: the student will be able to identify (a) the names of places and characters, (b) numbers, (c) time, (d) likes or dislikes, (e) articles of clothing, (f) beverages and foods, (g) professions, (h) places of origin, (i) descriptions of people, places or things, (j) desires and/or requests, (k) modes of travel, (l) and answers to questions posed in Spanish by characters in the film by pressing the proper key on the computer keyboard during viewing, if required, and subsequently by marking the correct answer on the digitek answer sheet provided during the posttest and delayed posttest.

### Treatment Development

The British Broadcasting Corporation (BBC) and Films Incorporated gave permission to the Department of Foreign Languages at the U.S. Air Force Academy to edit and master a videodisc using the first two lessons of a Spanish instructional television film series developed by the BBC entitled, Zarabanda. The lessons provide aural and visual stimuli in a natural way complemented by a dramatic story line. In fact, the film series in toto resembles a soap opera. Filmed in Spain and consisting of 25 episodes, the materials teach the kind of Spanish that will most likely be encountered in real life situations (Ariza, Sperber, & Fernández-Gasalla, 1972; Curland, 1982).

The investigator edited the first two episodes (lessons) of Zarabanda maintaining those components of the lesson which reflected the episodic development of the story line, and developed a videodisc containing the edited versions of these first two episodes. The resultant videodisc was used as the medium for the presentation of material in this study.

A research associate at the Department of Foreign Languages, U.S. Air Force Academy, handled the programming phase of lesson development. The Courseware

Design System (CDS) served as the authoring language. Spanish instructors and instructors of other languages at the Academy reviewed and critiqued the lessons programmed for the videodisc system which, in turn, prompted improvements in the original lesson design (see Appendix F for copies of Groups 2 and 3's lessons).

#### Implementation and Procedures

In an article entitled, "Interactive Video: Educational Tool or Toy," Bosco (1984) asks the reader to consider three different hypothetical teachers.

The first teacher lectures to the students and permits no interruptions for questions or comments from students. The second lectures but at particular points in the lecture stops and . . . asks a student to gauge the extent of understanding of the presentation. . . .

The third teacher is involved in continuous dialogue with students, stopping in mid-sentence to respond to cues that some students are not getting the desired understanding. (p. 17)

Bosco further explains that a videodisc can imitate each of these three teachers.

Bosco's rationale closely relates to the design of this study. What would be the effect on achievement and retention if Spanish language instructional material were presented via videodisc in a linear (Bosco's first hypothetical teacher, included for descriptive purposes only), segmented (the second teacher), and interactive fashion (the third teacher)? What effect would increasing levels of interaction have on the learning outcome? How would this affect retention? More specifically:

1. What would be the effect on achievement scores, as measured by a criterion based posttest, (a) if questions were introduced between segments of a Spanish language instructional videodisc or (b) if the material were presented in an interactive manner, that is, with questions, feedback on incorrect answers, video replay and hint options, explanatory statements and vocabulary lists available to the student?

2. What would be the effect on retention levels, as measured by a delayed administration of the same criterion based posttest, if the procedures mentioned in the preceding question were followed?

The following null hypothesis was tested: there will be no statistically significant difference in

achievement scores or retention levels, as measured by a criterion based posttest consisting of true/false and multiple choice items, attributable to the amount of interaction during instruction in the following groups: (a) segmented Spanish language instructional videodisc group, (b) interactive Spanish language instructional videodisc group and (c) control group.

Additionally, a linear Spanish language instructional videodisc group was included. The purpose of introducing the linear videodisc group was to offer a descriptive rather than an experimental comparison which reflects a traditional approach to film presentation in foreign language classrooms.

Groups 1, 2, and 3 viewed the first two edited lessons of Zarabanda. These two lessons, originally developed by the BBC, were divided, in turn, into four separate lessons (showings) and presented over a two week period. The amount of interaction to which each of the first three groups was subjected represented the independent variable. All four groups attended each of the four showings at the Language Learning Center, U.S. Air Force Academy. The experiment took place during regular classroom hours. All students were randomly assigned to carrels equipped with Sony hardware con-

sisting of an SMC-70 microcomputer, an LDP-1000 videodisc player and a 12" color monitor. Students used headsets, thus greatly reducing the possibility of distraction from extraneous noise. Since there were only nine videodisc learning stations available at one time, and over 12 students in every section, eight administrations of the treatments were carried out on "M" days and six administrations on "T" days. Thus, due to randomization, there were students from each of the experimental groups as well as the control group assigned to the Language Learning Center in each of the administrations of the lessons. For example, during a showing, there could be two students from Group 1, three from Group 2, two from Group 3, and two from Group 4, for a total of nine. After the first group of students was done, the remaining students in a particular section would proceed through the same showing.

The fields of anthropology and the social sciences argue for the use of observation as a valuable form of data collection, both from the perspective of the observer as well as the person being observed. The ethnographic approach to research offers data of a qualitative nature that is often missed by only using a quantitative approach (Robinson et al., 1985b;

Robinson, 1985c). Observations were made and recorded by the investigator during the entire period of the experiment.

All classes at the Academy started on 11 August, 1986. The experiment was begun 10 days later for the following reasons:

1. This early start ensured that students were as equal as possible in their knowledge of the language, even though the material presented during the experiment was not part of the curriculum. Nevertheless, the materials in the first two episodes of Zarabanda are accessible to students as comprehensible input owing to carefully controlled but authentic content.

2. The experiment was implemented with equipment which the Sony Corporation had loaned to the Department of Foreign Languages in order to conduct related research. Although the loan period had expired, Sony extended it so this experiment could be carried out.

Students in Group 1, the linear videodisc instruction group, were shown a series (four to 10) of text files in English on the computer monitor dealing with Spanish and Hispanic American culture which were completely unrelated to the experimental materials and the immediate and delayed posttests. The computer pre-



sented each screen of cultural information for approximately 30 seconds before moving on to the next screen. None of the cultural information was included in the questions asked during instruction nor in the immediate and delayed posttests. These cultural files were shown before and after the presentation of the instructional portion of the Zarabanda film, which formed the treatment, to help ensure that all groups worked at the carrels for the same amount of time per session.

Students in Group 2, the segmented videodisc instruction group, were shown the same series of cultural text files in English and the same portion of Zarabanda film as was Group 1. However, the presentation was programmed to stop at selected breakpoints. These breakpoints normally occurred at a change of scene or at the end of short dramatic sequences that presented logical opportunities to ask objective true/false and multiple choice questions in Spanish on content. The program paused until each student answered each question. If the student chose the correct answer via keystroke on the microcomputer, the feedback took the form of a remark such as, "Correct." If the student chose an incorrect answer, the feedback took the form of a remark such as, "Wrong." After a

pause, the program automatically moved on to the next scene.

Students in Group 3, the interactive videodisc instruction group, were presented the same material, minus the cultural text files, and asked the same questions in Spanish as Group 2. In addition, they had the benefit of feedback in English on incorrect answers, and could access on demand several help items, including Spanish/English vocabulary lists, hints in English, video replay options, and explanatory statements in English. Students could proceed through the lesson at their own pace, with the ability to return to areas where they had just experienced difficulty, and then move on in the lesson. If students chose the wrong answer to a multiple choice question, they had a choice of a hint or a chance to replay the portion of film that could help them with the answer. Once students chose either the hint or the replay help option, they were shown the chosen help option followed by the same question. If they answered incorrectly again, they were shown the alternate help option (hint or film replay). If they answered incorrectly a third time, the correct answer was provided, followed by an explanation. Thus, in all cases, whether or not students

selected the right answer on the first try, the program provided the reason the answer was correct. Students in Group 3 had continuous access to the vocabulary list throughout all of the showings. In case of a wrong answer for true/false questions, the screen displayed a corrective remark, a short explanatory statement, both in English, and a film replay.

Students in Group 4, the control group, were shown the same cultural text files as Groups 1 and 2, except that they watched "American Graffiti" on videodisc instead of Zarabanda. This group provided a baseline for posttest scores, and for later comparison with other groups.

#### Analysis of the Data

ANOVA (Analysis of Variance) procedures were used to analyze posttest and delayed posttest scores separately. Tukey-HSD (Honestly Significant Difference) procedures with an Alpha at the .05 level were used to determine differences among groups. The criterion based test reliability was determined via coefficient Alpha.

Data for the attitudinal questionnaires were submitted to descriptive statistical analyses as well as ANOVA procedures to determine if differences existed

between pre/post experiment results. In addition, selective item by item t tests were carried out to determine if statistically significant differences existed between pre/post experiment questionnaire answers within each group. For the latter, an Alpha of .002 was computed to be used with the t tests.

A Pearson Product Moment Correlation Coefficient procedure was used in an attempt to discover items on the pre-experiment attitudinal questionnaire that could be used as predictors of success on the criterion based test. The Statistical Package for the Social Sciences (SPSS) and the CDC Cyber computer at the University of Texas at Austin, served as the vehicles for all analyses.

## Chapter 4

### Results

#### Introduction

This study strives to increase the knowledge base on the effects of interaction on achievement and retention. The manner in which a Spanish language instructional videodisc program was presented to students yielded different levels of interaction among three treatment groups and a control group.

This chapter reports the results of the analyses that were carried out on the data in order to investigate the questions that were presented in Chapters 1 and 3. These questions are as follows:

1. What would be the effect on achievement scores, as measured by a criterion based posttest, (a) if questions were introduced between segments of a Spanish language instructional videodisc or (b) if the material were presented in an interactive manner, that is, with questions, feedback on incorrect answers, video replay and hint options, explanatory statements and vocabulary lists available to the student?

2. What would be the effect on retention levels, as measured by a delayed administration of the same

criterion based posttest, if the procedures mentioned in the preceding question were followed?

The following null hypothesis was tested: there will be no statistically significant difference in achievement scores or retention levels, as measured by a criterion based posttest consisting of true/false and multiple choice items, attributable to the amount of interaction during instruction in the following groups: (a) segmented Spanish language instructional videodisc group, (b) interactive Spanish language instructional videodisc group and (c) control group.

Additionally, a linear Spanish language instructional videodisc group was included. The purpose of introducing the linear videodisc group was to offer a descriptive rather than an experimental comparison which reflects a traditional approach to film presentation in foreign language classrooms.

To carry out the investigation, students were randomly assigned to the following treatment groups:

1. Group 1 - Linear videodisc instruction group (descriptive).
2. Group 2 - Segmented videodisc instruction group (experimental).

3. Group 3 - Interactive videodisc instruction group (experimental).

4. Group 4 - Control group.

Questionnaires were administered to measure pre/post experiment attitudes toward technology, the target language, and people and their culture, as well as the instructional materials themselves. The criterion measure, a posttest consisting of 40 items, measured the effects that the different treatments had on each of the groups. The same test, (given four weeks later), measured how each of the groups retained the material. Reliability of the measurement instrument was determined by a coefficient Alpha reliability procedure yielding a coefficient of .78.

#### Report of Analyses on Achievement Data

Table 1 contains means and standard deviations for the immediate posttest for all groups. This table reveals that the mean score for Group 3 was 26.26, or 9.61 points (24%) higher ( $p < .0001$ ) than the score (16.65) for Group 1, 6.53 points (16%) higher ( $p < .0001$ ) than the score (19.73) for Group 2, and 12.26 points (30%) higher ( $p < .0001$ ) than the score (14.00) for Group 4. The maximum possible score on the immediate posttest and delayed posttest was 40 points.

Table 1

Means and Standard Deviations for Achievement Scores on  
the Immediate Posttest

Treatment Group	<u>n</u>	Mean	Percent	SD
Gp 1 (linear)	23	16.65	41.62	3.86
Gp 2 (segmented)	23	19.73	49.32 <sup>*</sup>	4.63
Gp 3 (interactive)	23	26.26	65.65 <sup>**</sup>	4.97
Gp 4 (control)	23	14.00	35.00	3.19

<sup>\*</sup> $p < .05$ , significantly different from Gp 4 only.

<sup>\*\*</sup> $p < .0001$ , significantly different from all groups.

Table 2 presents means and standard deviations for the delayed posttest again for all groups. This table reveals that the mean score for Group 3 was 23.04, or 8.30 points (20%) higher ( $p < .0001$ ) than the score (14.74) for Group 1, 5.26 points (13%) higher ( $p < .0001$ ) than the score (17.78) for Group 2, and 7.83 points (19%) higher ( $p < .0001$ ) than the score (15.21) for Group 4.



Table 2

Means and Standard Deviations for Achievement Scores on  
the Delayed Posttest

Treatment Group	<u>n</u>	Mean	Percent	SD
Gp 1 (linear)	23	14.74	36.85	3.71
Gp 2 (segmented)	23	17.78	44.45	6.67
Gp 3 (interactive)	23	23.04	57.60*	7.43
Gp 4 (control)	23	15.21	38.02	3.80

\*  $p < .0001$ .

Tables 3 and 4 indicate a significant difference exists ( $p < .0001$ ) among the four groups on the immediate and delayed posttests after submission to a one-way analysis of variance. The Tukey-HSD (Honestly Significant Difference) procedure with an Alpha at the .05 level was used to determine the source of significance.

Table 3

Summary of Analysis of Variance for the Immediate  
Posttest

Source	df	SS	MS	F	p
Between Groups	3	1924.46	641.48	35.95	<.0001
Within Groups	88	1570.08	17.84		

Note. df = degrees of freedom, SS = sum of squares, MS = mean squares, F = F ratio, p = probability.

Table 4

Summary of Analysis of Variance for the Delayed  
Posttest

Source	df	SS	MS	F	p
Between Groups	3	771.39	257.13	7.87	<.0001
Within Groups	88	2874.08	32.66		

Tables 5 and 6 show that Group 3, the interactive videodisc instruction group, had a mean that was different at a statistically significant level ( $p < .0001$ ) from the means of each of the other groups. Tables 5

and 6 also indicate that Group 2, the segmented videodisc instruction group, had a mean that was different at a statistically significant level ( $p < .05$ ) from Group 4 on the immediate posttest but not on the delayed posttest. Results of the analysis permit the rejection of the null hypothesis and support the premise that interaction leads to greater achievement in the short term, and long term, even with a four-day instructional period.

Table 5

Significant Differences Among Treatment Group Means on the Immediate Posttest

Treatment Group	Posttest			
	Gp 1	Gp 2	Gp 3	Gp 4
Gp 1 (linear)	---	NS	*	NS
Gp 2 (segmented)	NS	---	*	**
Gp 3 (interactive)	*	*	---	*
Gp 4 (control)	NS	**	*	---

\*  $p < .0001$ .    \*\*  $p < .05$ .

Table 6

Significant Differences Among Treatment Group Means on  
the Delayed Posttest

Treatment Group	Retest			
	Gp 1	Gp 2	Gp 3	Gp 4
Gp 1 (linear)	---	NS	*	NS
Gp 2 (segmented)	NS	---	*	NS
Gp 3 (interactive)	*	*	---	*
Gp 4 (control)	NS	NS	*	---

\*  $p < .0001$ .

Table 7 depicts students' time on task for each of the four lessons. The reader should note that Group 4 watched "American Graffiti" instead of Zarabanda.

Table 7

Time on Task

	Gp 1	Gp 2	Gp 3	Gp 4
<u>First lesson</u>				
Cultural screens	2'30"	2'30"	0	2'30"
Treatment	5'35"	11'	15'	7'30"*
Cultural screens	6'55"	1'30"	0	5'
Total	15'	15'	15'	15'
<u>Second lesson</u>				
Cultural screens	3'	3'	0	3'
Treatment	6'45"	15'	20'	10'*
Cultural screens	10'15"	2'	0	7'
Total	20'	20'	20'	20'
<u>Third lesson</u>				
Cultural screens	2'	2'	0	2'
Treatment	4'	7'	10'	5'*
Cultural screens	4'	1'	0	3'
Total	10'	10'	10'	10'

(table continues)

---

	Gp 1	Gp 2	Gp 3	Gp 4
<hr/>				
<u>Fourth lesson</u>				
Cultural screens	2'	2'	0	2'
Treatment	7'25"	17'	20'	10'*
Cultural screens	10'35"	1'	0	8'
Total	20'	20'	20'	20'

---

Note. Group 2's time on task varied with each student but averaged to approximately three to five minutes less than Group 3. Some Group 3 students were done prior to the allotted time for a lesson, thus making their time on task shorter than indicated. \*Group 4 watched "American Graffiti" instead of Zarabanda.

#### Report of Analyses on Attitudinal Data

Table G-1 (Appendix G) contains the results of the pre-experiment questionnaire. Items dealing with interest and enjoyment of Spanish, and attitudes toward computer study are included in the questionnaire. A Pearson Product Moment Correlation Coefficient procedure was used in an attempt to discover items on the pre-experiment attitudinal questionnaire that could be used as predictors of success on the criterion based

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ACHIEVEMENT AND RETENTION OF SPANISH PRESENTED VIA  
VIDEODISC IN LINEAR SE. (U) AIR FORCE INST OF TECH  
WRIGHT-PATTERSON AFB OH 45433-1170

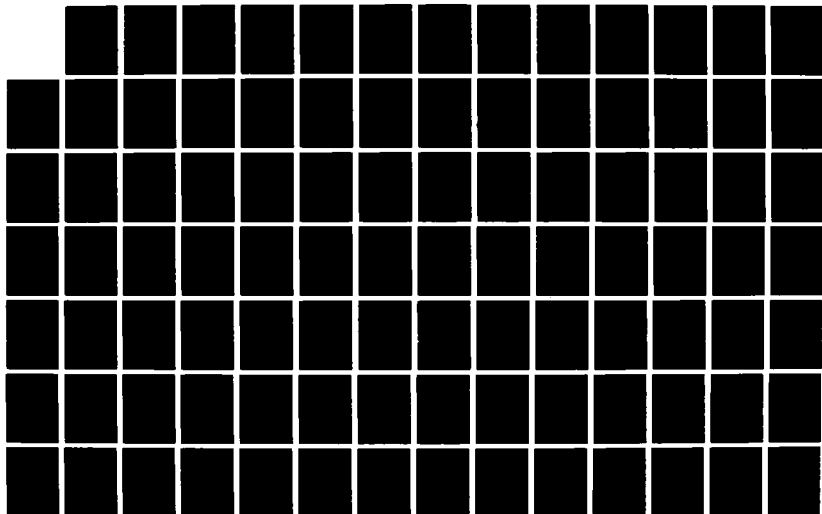
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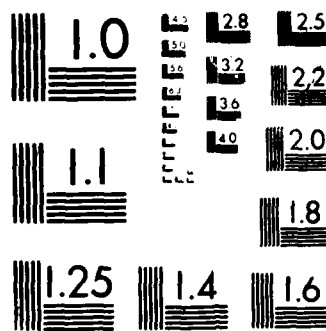
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963-A



test. However, no single variable could be isolated as a predictor of achievement.

Table G-2 (Appendix G) displays a summary of the results of the post-experiment questionnaire. A one-way analysis of variance yielded no statistically significant difference among the groups between pre/post experiment results.

Table G-3 (Appendix G) compares items selectively chosen from the pre/post experiment questionnaires. The items were selected because they appeared in both the pre and post-experiment questionnaires, although numbered differently in each. The results of the pre/post questionnaires of Groups 1, 2 and 3 were individually compared using a series of one-tailed t tests with an Alpha at the .002 level. No statistically significant differences were found.

Although ANOVA and one-tailed t tests yielded no significant differences between pre/post questionnaires, some descriptive responses within particular groups are reported herein. Results of the post-experiment questionnaire show that the impressions held by students in Group 1, the passive learners, toward Spanish speaking people improved over time. Group 1 members also felt more inclined to have Spanish speaking

friends at the end of the study. Their opinions on the item, "Spanish speakers don't talk right," also improved. In addition, Group 1 members, more than any other group, preferred learning a foreign language from an instructor, rather than from a computer. In contrast, students in Group 3, the interactive instruction group, showed the least preference for learning a foreign language from an instructor.

After the experiment, students in Group 2, the segmented videodisc instruction group, disagreed more with the statement, "Spanish speakers are friendly," and agreed more with the statement, "Spanish speakers are lazy." Group 2, however, showed gains in integrative motivation evidenced by gain scores on the statement, "I am studying Spanish so that I can understand more about Spanish speaking people and their culture." Group 2, more than any other group, preferred having a textbook when studying language.

Students in Group 3, the interactive instruction group, became more interested in learning Spanish after the experiment, as evidenced by their response to the question, "How interested are you in learning Spanish?." Students in Group 3 also felt a stronger desire to visit a Spanish speaking country. There were gains

on all questions dealing with integrative motivation for this group. Group 3 enjoyed using computers to learn new material more than any other group.

Regardless of any gains in pre/post questionnaire items that favored the use of technology in teaching foreign languages, students in all groups regarded the traditional classroom setting as necessary, including the teacher, textbook and the presence of other students. Students felt that instruction via interactive videodisc was an interesting and worthwhile adjunct to classroom instruction, but should not stand alone as the sole teaching medium.

#### Student opinions.

The post-experiment questionnaire contained three open ended questions which allowed the students to express their likes or dislikes about their participation in the experiment as well as any other general comments that they wished to make. Below are the three questions presented to all participants. The group member making the statement is identified by group number immediately after the statement.

The comments made by the control group are not included since their responses are not pertinent to the findings. The observations which follow are typical of

the majority of responses given. The responses given by students in Group 3, were consistently more elaborate and detailed.

Question # 1 - List one or two things that you enjoyed about working with computers during the lessons that you have been attending.

"It was interesting to watch a real life drama."

(Group 1)

"Watching Spanish video helps understand the spoken language." (Group 1)

"Let me hear the language." (Group 2)

"Let me see a Spanish environment." (Group 2)

"I think listening to the words and seeing them used in real life situations helped. I liked having it all to myself, and going at my speed, so I was able to learn." (Group 3)

"I liked the personal tone the computer used after I made a response. It makes you feel like you have an instructor right next to you." (Group 3)

"I liked the way the time passed by. I liked the way the computer showed how the phrases were used in everyday life. I liked the ability to 'replay' a certain section so I could understand it better." (Group 3)

Question # 2 - List one or two things that you did not like about working with computers during the lessons that you have been attending.

"It was frustrating that I could not understand a lot of what was being said." (Group 1)

"I had no input or choice." (Group 1)

"If you missed something you could not repeat."  
(Group 2)

"Need more control over the program--a chance to go back if we missed some dialogue. More interaction."  
(Group 2)

"I didn't get a chance to actually say the words or phrases outloud." (Group 3)

"I would like to have done it much longer."  
(Group 3)

Question # 3 - Include any general comments about your experiences in the Language Learning Center that you wish to add.

"I have no idea what other groups did, but I don't think that GP 1 learned anything better or faster by using this type of computer program." (Group 1)

"I would have liked to have known everything that was said in the video." (Group 1)

"I enjoyed it very much." (Group 2)

"If you get the wrong answer, repeat the scene and try the question again." (Group 2)

"I think it's a great way to learn, but I don't think it should replace teachers and textbooks, but it could be a very useful supplement to the traditional language class. Maybe used as a lab period once or twice a week." (Group 3)

"I don't really know what is going to come out of this survey, but I hope it includes an increase in this type of teaching." (Group 3)

#### Results of Observations

The investigator made numerous observations by taking notes as students proceeded through the videodisc lessons. A data collection capability would have been very helpful in capturing keystrokes for all students and in determining which help options were selected during instruction. However, the software necessary to carry out data collection of this nature was not available to the investigator. The investigator did observe and count keystrokes throughout the experiment for seven students in Group 3, one from each section; the average was 47. There were 35 keystrokes per student throughout the entire study for Group 2.

There was only one keystroke required of Group 1 students (to start the lesson). Although keystrokes are not necessarily a precise measure of interactivity, one can infer that all students in Group 3 interacted with the lesson more than students in Groups 1 and 2.

Students in Group 1 were very enthusiastic at the beginning of the experiment. During the first lesson, many students in this group sat on the edge of their chair and gazed intently at the screen in front of them. By the second lesson, the majority slouched in their chair or frequently looked at the clock.

Students in Group 2 pondered each question at length because they realized that there was only one chance to answer each item. For this group, the only feedback was a remark such as "Correct" or "Wrong." Consequently, as the computer lesson progressed, whenever an incorrect answer was made, many students would strike the carrel with their fists, grab the keyboard and squeeze it in frustration, or grab the chair in which they were sitting and squeeze the sides of the seat. The frustration level appeared to be very high for this group based on the behavior of the majority of its members as well as the verbal remarks that cannot be printed herewith. The majority of students in Group

2 seemed to finish the lesson just as time had expired. In other words, they seldom saw the cultural text files at the end of the lesson. Therefore, the amount of time that they spent working with the testable lesson material itself was only approximately three to five minutes less per lesson than Group 3.

Students in Group 3 appeared to be very interested in the interactive videodisc lessons. The majority of students in this group normally sat at the edge of their chair, and their faces were much closer to the screen than the students in any of the other groups. Students in this group seemed to dislike the idea that the lesson was over. Many made statements such as "I can't believe the time is up already," or asked a question such as "Time's up?" Some students in this group took advantage of as many options as were available to them and consequently were not able to finish some lessons before time expired. However, a greater number was finished two to four minutes before time had expired and consequently waited at the carrels until all groups had completed the lesson. Even though this group had access to a vocabulary list (Appendix H) during the interactive lessons, this option appeared to be



the least used based on the investigator's observations.

There were many positive comments from students in all groups. One in particular struck the investigator as being rather humorous. A student in Group 3 made a statement in the hall en route to the Language Learning Center, "This is the best thing that happens to me during the day, [pause] next to prayers."

#### Summary

Results of the analyses of the data allow the rejection of the null hypothesis. The mean scores on the immediate and delayed posttests for Group 3, the interactive videodisc instruction group, were higher than all other groups ( $p < .0001$ ). Results of the immediate posttest also showed Group 2 to have a mean score that was higher than the control group, Group 4 at a statistically significant level ( $p < .05$ ). Pre/post experiment questionnaire results were mixed and showed no statistically significant score differences after the experiment. Group 3 showed a stronger desire to learn Spanish after the experiment than all other groups. Although Group 2 posted gain scores on some items dealing with integrative motivation, Group 3 was the only group to exhibit gains on all items deal-

ing with integrative motivation as well as the item dealing with the use of technology in learning new material.

## Chapter 5

### Summary, Discussion, and Recommendations

#### Overview

Technological developments with applications to foreign language education continue to appear, seemingly on a daily basis. These new technologies progress so quickly that they present a constant challenge to educators who strive to stay abreast of developments. Interactive videodisc, an approach to second language teaching/learning, is one of the relatively new technologies which promise to provide the qualitative difference that many educators claim to be essential but find lacking in many foreign language classrooms--interaction. The road to making interactive videodisc more available remains incomplete for the lack of software. The seemingly unceasing demand on educators to stay current with advances in technology often robs them of the time needed to design the necessary software that could release the powerful instructional potential of already existing computer-driven media. A great need exists to develop materials that are pedagogically sound and that take optimum advantage of the capabilities of the new systems. Although technological innovations are beginning to drive a fair

proportion of foreign language instruction/learning research, the amount of research dealing with interactive videodisc is still very limited. Therefore, this study evolved out of the need to begin to fill the relative void that now exists in research dealing with the effectiveness of interactive videodisc.

This study investigated the effects on achievement and retention of beginning Spanish instructional material presented via videodisc in linear, segmented, and interactive modes. The study was conducted at the United States Air Force Academy in Colorado Springs. Students ( $N = 92$ ) enrolled in a beginning Spanish course were randomly assigned to three treatment groups and a control group.

Group 1 ( $\underline{n} = 23$ ), the linear videodisc instruction group (descriptive), was presented Spanish instructional material via videodisc in a passive manner. Group 2 ( $\underline{n} = 23$ ), the segmented videodisc instruction group (experimental), was presented the same material as Group 1 with the addition of inserted true/false and multiple choice objective questions on content at selected breakpoints in the story line. Students in this group received limited feedback in the form of

remarks such as "Correct" or "Wrong." Students in Group 2 could not return to any portion of the lesson with which they had difficulty nor attempt a missed question again. The lesson for Group 3 ( $\underline{n} = 23$ ), the interactive videodisc instruction group (experimental), was interrupted by the same questions at the same breakpoints as Group 2 with the additional benefit of feedback on incorrect choices, vocabulary lists, video replay and hint options for remediation. The program also provided explanatory statements on correct choices. Group 4 ( $\underline{n} = 23$ ), the control group, was presented with material in English that was totally unrelated to the material presented to the previous three groups. By administering the posttest to this group, information that would normally be derived from the administration of a pretest was obtained without prejudicing the results.

Groups 1, 2 and 4 were presented with cultural text files in English that preceded and followed each lesson to maintain all groups at the computer carrels for the same amount of time. The textual material would appear on the computer monitor for 30 seconds after which time a new text file would appear. None of

the cultural material was tested during the videodisc lessons nor on the immediate or delayed posttests.

The videodisc used for the experiment was mastered from the first two edited lessons of the British Broadcasting Corporation's Zarabanda film series. The videodisc contains a series of dialogues (Appendix I) intertwined by a dramatic story line resembling a soap opera. The Zarabanda material was selected for the study because it teaches the kind of Spanish that will most likely be encountered in real life situations by beginning students.

All students took a 40-item true/false (10 questions) and multiple choice (30 questions) criterion based posttest. A delayed posttest, using the same instrument, was administered to all groups one month later. The test reflected the activities included in the experimental lessons for Groups 1, 2 and 3. A coefficient Alpha procedure was used to determine the reliability of the test yielding a coefficient of .78. In addition, all students completed pre/post experiment questionnaires.

#### Summary of Findings

The analyses of the data indicated that the results of the immediate and delayed posttests for

Group 3, the interactive videodisc instruction group, were significantly higher ( $p < .0001$ ) than all other groups. These results are consistent with the findings of Schrupp, Bush, and Mueller (1983) in which students of German presented material in an interactive fashion outscored students who watched the same film in a linear and passive fashion. Results of another study (Abrams & Streit, 1986) using interactive video compared to linear video in the teaching of basic photography skills also agree with the results of the present study.

The results of the study reported herein also indicated that Group 2, the segmented videodisc instruction group, scored significantly higher ( $p < .05$ ) than the control group on the immediate posttest, but not on the delayed posttest. The fact that Group 2 scored significantly higher than the control group on the immediate posttest suggests that the insertion of questions at selected breakpoints in the story line improved learning as was found in the study conducted by Kurtz, Walter and Brenner (1950). However, when the same questions were asked of Group 3 with the addition of feedback on incorrect choices, vocabulary lists, and video replays and hint options for remediation, the

results were dramatically better. The capability of the videodisc to access video materials randomly and instantly probably facilitated learning as was the case in several previous studies (Bunderson, 1981; Crotty, 1984; Ebner et al., 1984).

The positive responses from students in Group 3 to questions 42 to 47, (Appendix G, Table G-2), suggest the frequent use of student options during instruction, including video replays and hints for remediation. The capability of the interactive videodisc lesson to focus the student's attention on a particular facet of linguistic data presented in the Zarabanda film by asking a question, and then giving the student video replays or hint options to answer the question correctly a second or third time, if needed, appears to be the factor that best explains the superior results obtained by Group 3.

Given that all groups spent the same amount of time at the computer carrels during instruction, the actual time that Group 2 spent working with the material that was tested on the immediate and delayed posttests was only three to five minutes less per lesson than Group 3. One may conclude that interaction, a concept that includes the element of practice, is most



likely the factor that best accounts for the superior results of Group 3, the interactive videodisc instruction group.

Group 1 was included in the study for descriptive purposes only. Because of Group 1's linear mode of presentation of the Zarabanda videodisc, this group was exposed to the material for less time per lesson than Groups 2 and 3. Therefore, determining whether the difference in achievement is attributable to difference in treatment, or time on task becomes difficult. Nevertheless, Group 1's mean score (14.74) was lower than that of the control group (15.21) on the delayed posttest. These results suggest that for Group 1: (a) little learning occurred during the linear showing of the Zarabanda film, an instructional approach to film presentation that very closely resembles that used in many traditional foreign language classrooms, (b) a large amount of guessing transpired on both the immediate and the delayed posttests, and (c) the material was not retained because little learning initially took place, possibly due to the short exposure time. Second, the standard deviations for Groups 2 and 3 on the delayed posttest were much larger (SD 6.67 and SD 7.43 respectively) than on the immediate posttest (SD 4.63

and SD 4.97 respectively) suggesting that a greater spread, (more heterogeneous distribution), in test scores from the mean occurred as a function of time away from the material.

Results of the post-experiment questionnaire show that the impressions held by students in Group 1, the passive learners, toward Spanish speaking people improved. Group 1 members also felt more inclined to have Spanish speaking friends at the end of the study. Their opinions on the item, "Spanish speakers don't talk right," also improved. In addition, Group 1 members, more than any other group, preferred learning a foreign language from an instructor, rather than from a computer. This preference is understandable, since their role was a totally passive one. In contrast, students in Group 3, the interactive videodisc group, showed the least preference for learning a foreign language from an instructor.

After the experiment, Group 2 students, the segmented videodisc group, disagreed more with the statement, "Spanish speakers are friendly," and agreed more with the statement, "Spanish speakers are lazy." These negative feelings could stem from the frustration that this group felt as it proceeded through the lessons.

Group 2's frustrations are discussed in the "Results of Observations" section, Chapter 4. Group 2, however, showed gains in integrative motivation evidenced by gain scores on the statement, "I am studying Spanish so that I can understand more about Spanish speaking people and their culture." Group 2, more than any other group, preferred having a textbook when studying language. This preference could stem from the fact that members of this group could not return to portions of the lesson that they did not understand as members of Group 3 could or as can be done in a limited manner with a textbook.

Students in Group 3, the interactive videodisc group, became more interested in learning Spanish after the experiment, as evidenced by their response to the question, "How interested are you in learning Spanish?." Students in Group 3 also felt a stronger desire to visit a Spanish speaking country. Group 3 enjoyed using computers to learn new material more than any other group. There were gains on all questions dealing with integrative motivation for Group 3. The novelty of the technology was probably not an influencing factor in the gains in the areas just mentioned since all experimental groups were fairly familiar with computer

technology, as evidenced by the answers on the pre-experiment questionnaire to questions six and seven (Appendix B). Additionally, these gains are consistent with the findings of Robinson et al. (1985b) whose results showed significant gains in post-experiment integrative motivation. One could conclude that Group 3 students' active involvement, through interaction, with the dramatic and realistic presentation of Spanish life in the Zarabanda film, kindled a sincere desire to travel in the areas which they had just seen and to learn more about the language, Spanish speaking people and their culture (see "Assumptions," Chapter 1).

#### Limitations

1. The stereotypical manner in which the characters and living standards of the target country, namely Spain, were represented in the film series "Zarabanda" that was used in the study, may have conceivably created a negative image of that culture in the minds of students (G. Robinson, personal communication, November, 1984). However, the first two lessons of this film series were the only two lessons of professional quality instructional film in Spanish available on videodisc at the time.

2. The amount of material that could be used for the experiment was limited to the amount that was already on videodisc. Preferably, several additional lessons on videodisc would have been desirable to extend the length of the study, however, the cost of production and mastering were prohibitive.

3. Proficiency, as defined by the American Council on the Teaching of Foreign Languages (ACTFL), was not tested because of the brevity of the lessons, the relatively short amount of time allocated for the experiment, and because students were forbidden to discuss the material learned during the course of the study denying them practice opportunities apart from their contact with the material during the computer-driven lessons.

4. Differences in exposure time to the instructional material among the groups made the comparison between the linear and the interactive treatments inconclusive. However, the positive effect of interactive videodisc on learning was clearly supported.

### Discussion

This study and previous studies involving interactive video and CAI are beginning to confirm intuitions and support the theoretical framework concerning the

effectiveness of these emerging technologies. The present study offers evidence in favor of the active involvement of the student in the learning process and highlights the concept of interaction as a crucial element which improves the foreign language teaching/learning paradigm. Perhaps equally as important, has been the integration of a number of Robinson et al.'s (1985b) (Chapter 2) pedagogical and answer-judging hypotheses in the lesson design used as the interactive treatment for this study, making it the first comprehensive application of these hypotheses within an interactive videodisc setting.

Based on the results of this study and previous studies involving interactive video, one may postulate that the interactive technology holds the potential, in the immediate and long range future, to provide qualitative improvements in the foreign language teaching/learning paradigm. Improvements in many areas of second language instruction are possible with careful design and the judicious use of the capabilities of interactive technology. The key lies not necessarily with the media, even though the media acts as a facilitating tool, but rather, with the quality of the inter-

actions within the lesson design and the lesson design itself.

The active involvement of students with lesson material will become a more attainable goal than was possible in the past. The limitations to interact extensively with each and every student found characteristically in traditional language classrooms will be alleviated by harmoniously combining classroom instruction with the capabilities of the computer-driven media. The optimum instructor/technology combination will have to be determined by arriving at a suitable time element (ratio) spent with each component during instruction.

Attitudes toward subject matter and technology itself show improvement consistently, although not always significantly, after student contact with the computer-driven lessons cited in the present study (Abboud, 1971; Abrams & Streit, 1986; Bunderson, 1981; Crotty, 1984; Nelson, Ward, Desch, & Kaplow, 1976; Robinson et al., 1985b). These "trends" give further support for the use of interactive video in second language instruction, making the technology and its end product more beneficial for the student.

The findings of this study have clear implications for foreign language teaching/learning. Instructional programs which use aural and visual materials in the form of videodiscs incorporating the winning strategies developed by Robinson et al., need to be integrated into language courses. All materials used in a course should be well coordinated and form a unified entity. Foreign language instructional material should be developed in such a way that those components of instruction that are dynamic, unpredictable, and divergent, such as conversation, are best assigned to the human teacher, whereas those components of instruction that are static and predictable are best relegated to technology.

Additionally, a concerted effort is needed to establish a consortium of subject matter experts, programmers, and experts in the technology to be used (team approach) to develop a software base for various languages comprised of accompanying videodiscs, lesson design, and appropriate integration of textbooks and classrooms materials into a unified course of instruction.



### Suggestions for Future Research

A research project which will equalize the potential for exposure to instructional material and time on task is needed to determine which, if either, interactive video or linear treatments, leads to greater achievement and retention; possibly different treatments will be preferable for different learners and for different stages of learning (the investigator's next proposed study).

Bork (1982) has summarized the most pertinent theoretical approaches to learning by pointing to two concepts that consistently appear in the literature on learning theory. These two ideas are: (a) that learning is best when the student is active in the learning process and (b) that individuals learn in different ways along numerous dimensions. The results of this study lend support to the first idea, but much more research is needed on the second concept; research that will take into consideration learning strategies, psychological constructs and attitudinal aptitude for language learning. One study that has laid the initial groundwork for this type of research is that of Bush (1983). Bush investigated personality, attitudinal, motivational, and cognitive variables in developing and

validating a model that better explains the process involved in learning a second language.

Results of the present study revealed that students missed the ability to speak the language during the computer-driven lessons. Technological developments in voice recognition and speech synthesis will open, in the near future, a vast area for research to investigate the capabilities of the new computer-driven media to carry on a conversation with a student. These speech recognition and production capabilities coupled with artificial intelligence, (the first artificial intelligence chip was announced by Texas Instruments in March, 1987), will require an entirely new perspective and approach to lesson design along with preliminary and on-going research.

The introduction into the market of the compact disc (CD), a smaller version of the videodisc encoded digitally and capable of storing vast numbers of still frames and text files, presents yet another opportunity for research. How will this medium fit into the continuum of media available to educators? What would be the most efficient and effective use of CD? How can the capabilities of CD and interactive videodisc be used together to the best advantage?

The pedagogical hypotheses and the answer-judging hypotheses proposed by Robinson et al. (1985b) for CAI, could be more fully applied to research with interactive video. Long range studies that incorporate interactive videodisc instruction into the normal curriculum may provide more accurate data to support the effectiveness of interactive videodisc in foreign language teaching/learning.

## Appendix A

Table A-1

### Biographical Characteristics of Sample

	Gp1	Gp2	Gp3	Gp4
<b>Sex</b>				
Male	23	20	22	22
Female	0	3	1	1
Total	23	23	23	23
<b>Age</b>				
18 yrs.	7	6	6	13
19 yrs.	12	13	12	9
20 yrs.	1	2	4	0
21 yrs.	1	1	0	0
22 yrs.	2	1	1	1
Total	23	23	23	23
Mean	19	19	19	18.5

(table continues)

	Gp1	Gp2	Gp3	Gp4
<hr/>				
Previous Spanish				
None	11	10	12	9
2 semesters	6	7	7	4
3 semesters	1	0	0	1
4 semesters	4	6	3	9
5 semesters	1	0	0	0
8 semesters	0	0	1	0
Total	23	23	23	23
Mean	1.56	1.65	1.47	2.04
Other languages				
None	18	16	17	19
1-2 yrs.	5	7	6	4
Total	23	23	23	23
Mean Academic				
Composite	3,034	3,027	3,053	3,098
<hr/>				

## Appendix B

### Pre-Experiment Questionnaire

#### PRIVACY ACT STATEMENT

In accordance with paragraph 30, AFR 12-35, Air Force Privacy Act Program, the following information about this survey is provided:

**AUTHORITY:** Title 10, United States Code, 8012 and AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

**PRINCIPAL PURPOSE:** To evaluate student attitudes towards the Spanish language, Spanish speakers and interactive videodisc technology when used to present Spanish language material.

**ROUTINE USES:** The data provided by this questionnaire will be used to better understand the role of interactive videodisc technology in the teaching of foreign languages.

**DISCLOSURE IS VOLUNTARY:** Completion of the questionnaire is voluntary; however, if there is not full participation by a representative cross-section of cadets, the results of this study could be biased. Therefore, your full participation is requested and appreciated. No adverse action will be taken against you if you refuse to complete the questionnaire.

## STUDENT QUESTIONNAIRE

TO THE STUDENT: Please respond carefully and honestly to the items asked of you in this questionnaire. Your answers are very important to the success of this study. Mark your answers carefully on the digitek answer sheet. Thank you for your cooperation!

Section I

1. WHAT OTHER FOREIGN LANGUAGES (BESIDES SPANISH) HAVE YOU FORMALLY STUDIED?
  - a. French
  - b. German
  - c. Japanese
  - d. Chinese
  - e. Arabic
  - f. Russian
  - g. other
2. WHAT LANGUAGES OTHER THAN (OR BESIDES) ENGLISH DO YOU SPEAK AT HOME?
  - a. French
  - b. German
  - c. Japanese
  - d. Chinese
  - e. Arabic
  - f. Russian
  - g. other
3. WHAT LANGUAGES OTHER THAN (OR BESIDES) ENGLISH DOES YOUR FAMILY SPEAK AT HOME?
  - a. French
  - b. German
  - c. Japanese
  - d. Chinese
  - e. Arabic
  - f. Russian
  - g. other
4. HAVE YOU HAD ANY MUSICAL TRAINING?
  - a. Yes
  - b. No

GO ON TO THE NEXT PAGE

5. IF YOU ANSWERED "Yes" TO QUESTION # 4, HOW LONG? (if "No," disregard)
- a. 1 year
  - b. 2 years
  - c. 3 years
  - d. 4 years
  - e. 5 years
  - f. 6 years
  - g. 7 years
6. HOW MANY TIMES HAVE YOU HAD EXPERIENCE (USED OR PLAYED) WITH A COMPUTER?
- a. Never
  - b. 1 to 10 times
  - c. 10 to 20 times
  - d. 2 to 6 months
  - e. 7 to 12 months
  - f. 1 to 2 years
  - g. 2 years or more
7. WHAT WERE THE MAIN REASONS (INCLUDING GAMES) FOR USING THE COMPUTER WHEN YOU DID USE IT?
- a. Games
  - b. Programming
  - c. Word Processing
  - d. Learning/Educational
  - e. Other
8. HOW INTERESTED ARE YOU IN USING COMPUTERS?
- a. Not at all
  - b. Somewhat interested
  - c. Interested
  - d. Very interested
  - e. Extremely interested
9. WHAT INTERESTS YOU MOST ABOUT COMPUTERS?
- a. Nothing
  - b. Programming
  - c. Games
  - d. Word processing
  - e. The fact that they save time
  - f. The fact that they help me learn
  - g. Other

GO ON TO THE NEXT PAGE



10. WHAT INTERESTS YOU LEAST ABOUT COMPUTERS?
- a. Programming
  - b. Using them as a learning aid
  - c. Operation/Mechanics
  - d. Nothing
  - e. Other
11. DO YOU KNOW HOW TO TYPE?
- a. Yes
  - b. No
12. HOW INTERESTED ARE YOU IN LEARNING SPANISH?
- a. Not at all
  - b. Somewhat interested
  - c. Interested
  - d. Very interested
  - e. Extremely interested
13. HOW MUCH DO YOU ENJOY SPANISH IN COMPARISON TO OTHER SUBJECTS?
- a. Spanish is my least favorite subject
  - b. Spanish is somewhat interesting
  - c. Spanish is interesting
  - d. Spanish is very interesting
  - e. Spanish is my favorite subject
14. WHAT IS YOUR MOST IMPORTANT REASON FOR STUDYING SPANISH?
- a. Language learning
  - b. Travel
  - c. Credits: College/High School
  - d. Future jobs
  - e. To learn about other people
  - f. To communicate with other people
  - g. Other
15. WHAT ARE YOUR GENERAL IMPRESSIONS OF SPANISH-SPEAKING PEOPLE?
- a. Negative
  - b. Neutral
  - c. Positive

GO ON TO THE NEXT PAGE

16. HAVE YOU EVER MET OR SPOKEN TO SOMEONE WITH A SPANISH ACCENT?
- a. Yes
  - b. No
17. IF "Yes," WHERE WAS HE OR SHE FROM? (if "No," disregard)
- a. Mexico
  - b. Spain
  - c. South America
  - d. Central America
  - e. United States
  - f. Other
18. WHAT WERE YOUR PARTICULAR IMPRESSIONS OF THAT PERSON? (if you answered "No" to question # 16, disregard this question)
- a. Negative
  - b. Neutral
  - c. Positive

## Section II

In this section we want you to tell us if you agree or disagree with some statements about Spanish-speaking people.

Instructions: Mark your answer CAREFULLY on the digitek answer sheet using the scale provided.

a.	b.	c.	d.	e.
STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

19. SPANISH SPEAKERS ARE FRIENDLY.
20. I WOULD LIKE TO HAVE SPANISH-SPEAKING FRIENDS.
21. SPANISH SPEAKERS DON'T TALK RIGHT.
22. SPANISH SPEAKERS ARE INTELLIGENT.
23. SPANISH SPEAKERS ARE LAZY.

GO ON TO THE NEXT PAGE

a.	b.	c.	d.	e.
STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

24. I WOULD LIKE TO VISIT A SPANISH-SPEAKING COUNTRY.
25. SPANISH SPEAKERS ARE WELL LIKED IN SCHOOL.
26. LEARNING SPANISH WILL HELP ME IN MY AIR FORCE CAREER.
27. I WANT TO LEARN SPANISH TO USE IN TRAVEL.
28. I WANT TO LEARN SPANISH IN ORDER TO MAKE NEW FRIENDS WITH SPANISH SPEAKERS IN THIS COUNTRY.
29. I AM STUDYING SPANISH SO THAT I CAN UNDERSTAND MORE ABOUT SPANISH-SPEAKING PEOPLE AND THEIR CULTURE.
30. I ENJOY USING COMPUTERS TO LEARN NEW MATERIAL.
31. I PREFER LEARNING A FOREIGN LANGUAGE FROM AN INSTRUCTOR.
32. I PREFER STUDYING LANGUAGE WITH OTHER STUDENTS AROUND.
33. I PREFER STUDYING A FOREIGN LANGUAGE IN A CLASSROOM SETTING.
34. I PREFER HAVING A TEXTBOOK WHEN I STUDY LANGUAGE.

STOP

## Appendix C

### Post-Experiment Questionnaire

#### PRIVACY ACT STATEMENT

In accordance with paragraph 30, AFR 12-35, Air Force Privacy Act Program, the following information about this survey is provided:

**AUTHORITY:** Title 10, United States Code, 8012 and AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

**PRINCIPAL PURPOSE:** To evaluate student attitudes towards the Spanish language, Spanish speakers and interactive videodisc technology when used to present Spanish language material.

**ROUTINE USES:** The data provided by this questionnaire will be used to better understand the role of interactive videodisc technology in the teaching of foreign languages.

**DISCLOSURE IS VOLUNTARY:** Completion of the questionnaire is voluntary; however, if there is not full participation by a representative cross-section of cadets, the results of this study could be biased. Therefore, your full participation is requested and appreciated. No adverse action will be taken against you if you refuse to complete the questionnaire.

## STUDENT QUESTIONNAIRE

TO THE STUDENT: Please respond carefully and honestly to the items asked of you in this questionnaire. Your answers are very important to the success of this study. Mark your answers carefully on the digitek answer sheet. Thank you for your cooperation!

Section I

1. HOW INTERESTED ARE YOU IN USING COMPUTERS?
  - a. Not at all
  - b. Somewhat interested
  - c. Interested
  - d. Very interested
  - e. Extremely interested
2. WHAT INTERESTS YOU MOST ABOUT COMPUTERS?
  - a. Nothing
  - b. Programming
  - c. Games
  - d. Word processing
  - e. The fact that they save time
  - f. The fact that they help me learn
  - g. Other
3. WHAT INTERESTS YOU LEAST ABOUT COMPUTERS?
  - a. Programming
  - b. Using them as a learning aid
  - c. Operation/Mechanics
  - d. Nothing
  - e. Other
4. HOW INTERESTED ARE YOU IN LEARNING SPANISH?
  - a. Not at all
  - b. Somewhat interested
  - c. Interested
  - d. Very interested
  - e. Extremely interested

GO ON TO THE NEXT PAGE

5. HOW MUCH DO YOU ENJOY SPANISH IN COMPARISON TO OTHER SUBJECTS?
- a. Spanish is my least favorite subject
  - b. Spanish is somewhat interesting
  - c. Spanish is interesting
  - d. Spanish is very interesting
  - e. Spanish is my favorite subject
6. WHAT IS YOUR MOST IMPORTANT REASON FOR STUDYING SPANISH?
- a. Language learning
  - b. Travel
  - c. Credits: College/High School
  - d. Future jobs
  - e. To learn about other people
  - f. To communicate with other people
  - g. Other
7. WHAT ARE YOUR GENERAL IMPRESSIONS OF SPANISH-SPEAKING PEOPLE?
- a. Negative
  - b. Neutral
  - c. Positive
8. HAVE YOU EVER MET OR SPOKEN TO SOMEONE WITH A SPANISH ACCENT?
- a. Yes
  - b. No
9. IF "Yes," WHERE WAS HE OR SHE FROM? (if "No," disregard)
- a. Mexico
  - b. Spain
  - c. South America
  - d. Central America
  - e. United States
  - f. Other
10. WHAT WERE YOUR PARTICULAR IMPRESSIONS OF THAT PERSON? (if you answered "No" to question # 16, disregard this question)
- a. Negative
  - b. Neutral
  - c. Positive

GO ON TO THE NEXT PAGE

Section II

In this section we want you to tell us if you agree or disagree with some statements about Spanish-speaking people.

Instructions: Mark your answer CAREFULLY on the digitek answer sheet using the scale provided.

a.	b.	c.	d.	e.
STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

11. SPANISH SPEAKERS ARE FRIENDLY.
12. I WOULD LIKE TO HAVE SPANISH-SPEAKING FRIENDS.
13. SPANISH SPEAKERS DON'T TALK RIGHT.
14. SPANISH SPEAKERS ARE INTELLIGENT.
15. SPANISH SPEAKERS ARE LAZY.
16. I WOULD LIKE TO VISIT A SPANISH-SPEAKING COUNTRY.
17. SPANISH SPEAKERS ARE WELL LIKED IN SCHOOL.
18. LEARNING SPANISH WILL HELP ME IN MY AIR FORCE CAREER.
19. I WANT TO LEARN SPANISH TO USE IN TRAVEL.
20. I WANT TO LEARN SPANISH IN ORDER TO MAKE NEW FRIENDS WITH SPANISH SPEAKERS IN THIS COUNTRY.
21. I AM STUDYING SPANISH SO THAT I CAN UNDERSTAND MORE ABOUT SPANISH-SPEAKING PEOPLE AND THEIR CULTURE.
22. I ENJOY USING COMPUTERS TO LEARN NEW MATERIAL.
23. I PREFER LEARNING A FOREIGN LANGUAGE FROM AN INSTRUCTOR.
24. I PREFER STUDYING LANGUAGE WITH OTHER STUDENTS AROUND.
25. I PREFER STUDYING A FOREIGN LANGUAGE IN A CLASSROOM SETTING.
26. I PREFER HAVING A TEXTBOOK WHEN I STUDY LANGUAGE.

GO ON TO THE NEXT PAGE

INSTRUCTIONS: Please read the next four lines CAREFULLY.

Group I members -- Proceed to Section III.  
Group II members -- Proceed to Section IV.  
Group III members -- Proceed to Section V.  
Group IV members -- Proceed to Section VI.



Section III - Group I members ONLY.

Instructions: If you are in Group I, answer the following questions by CAREFULLY marking your choice on your digitek answer sheet using the scale provided. MAKE SURE THAT YOU MATCH THE QUESTION NUMBER WITH THE CORRECT NUMBER ON THE DIGITEK ANSWER SHEET.

a.	b.	c.	d.	e.
STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

27. I DID NOT ENJOY THE FACT THAT I HAD NO CONTROL OVER THE LESSON.
28. I FELT THE MATERIAL PRESENTED WAS THE RIGHT LEVEL FOR MY ABILITIES.
29. I MISSED BEING ABLE TO "SPEAK" THE LANGUAGE.
30. I FELT THAT THE VIDEO HELPED ME UNDERSTAND WHAT WAS BEING SAID.
31. I WISH I COULD HAVE HAD CONTROL OF THE LESSON.

Group I members, once you have answered the questions in this section (Section III), PROCEED TO SECTION VII.

Section IV - Group II members ONLY.

Instructions: If you are in Group II, answer the following questions by CAREFULLY marking your choice on your digitek answer sheet. MAKE SURE THAT YOU MATCH THE QUESTION NUMBER WITH THE CORRECT NUMBER ON THE DIGITEX ANSWER SHEET.

a.	b.	c.	d.	e.
STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

32. I DID NOT ENJOY THE FACT THAT I HAD NO CONTROL OVER THE LESSON.
33. I FELT THE MATERIAL PRESENTED WAS THE RIGHT LEVEL FOR MY ABILITIES.
34. I MISSED BEING ABLE TO "SPEAK" THE LANGUAGE.
35. I DID NOT ENJOY BEING ASKED QUESTIONS BY THE COMPUTER AND NOT BEING GIVEN THE CORRECT ANSWERS AFTERWARDS WHENEVER I ANSWERED INCORRECTLY.
36. I WISH I COULD HAVE HAD CONTROL OF THE LESSON.

Group II members, once you have answered the questions in this section (Section IV), PROCEED TO SECTION VII.

Section V - Group III members ONLY.

Instructions: If you are in Group III, answer the following questions by CAREFULLY marking your choice on your digitek answer sheet. MAKE SURE THAT YOU MATCH THE QUESTION NUMBER WITH THE CORRECT NUMBER ON THE DIGITEK ANSWER SHEET.

a.	b.	c.	d.	e.
STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

37. I FELT THE MATERIAL PRESENTED WAS THE RIGHT LEVEL FOR MY ABILITIES.
38. I MISSED BEING ABLE TO "SPEAK" THE LANGUAGE.
39. I ENJOYED THE ONE-ON-ONE NATURE OF THE INTERACTIVE VIDEODISC SYSTEM.
40. I FOUND THAT TIME PASSED VERY QUICKLY WHILE USING THE INTERACTIVE VIDEODISC SYSTEM.
41. I WOULD RECOMMEND INTERACTIVE VIDEODISC LEARNING TO OTHER BEGINNING LANGUAGE STUDENTS.
42. I USED THE STUDENT CONTROL OPTIONS FREQUENTLY.
43. I UNDERSTOOD WHAT THE IMPORTANT PARTS OF THE LESSON WERE.
44. I DIDN'T LIKE HAVING TO RESPOND TO EVERY QUESTION.
45. I FOUND THE STUDENT CONTROL OPTION "REPLAY" USEFUL.
46. I LIKED GETTING FEEDBACK EVERY TIME I MADE A RESPONSE.
47. I LIKED BEING ABLE TO GO BACK TO A PORTION OF THE LESSON THAT I DID NOT UNDERSTAND.

Group III members, once you have answered the questions in this section (Section V), PROCEED TO SECTION VII.

Section VI - Group IV members ONLY.

Instructions: If you are in Group IV, answer the following questions by CAREFULLY marking your choice on your digitek answer sheet. MAKE SURE THAT YOU MATCH THE QUESTION NUMBER WITH THE CORRECT NUMBER ON THE DIGITEK ANSWER SHEET.

a.	b.	c.	d.	e.
STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

48. I DID NOT ENJOY THE FACT THAT I HAD NO CONTROL OVER THE LESSON.
49. I FELT THE MATERIAL PRESENTED WAS THE RIGHT LEVEL FOR MY ABILITIES.
50. I MISSED BEING ABLE TO "SPEAK" THE LANGUAGE.
51. I FELT THAT THE POSTTEST HAD NOTHING TO DO WITH WHAT I WAS SHOWN ON THE COMPUTER MONITOR.
52. I DID NOT ENJOY THE REPETITION OF THE LESSON.
53. I WISH I COULD HAVE HAD CONTROL OF THE LESSON.

Group IV members, once you have answered the questions in this section (Section VI), PROCEED TO SECTION VII.

Section VII - All Groups.

List one or two things that you enjoyed about working with computers during the lessons that you have been attending.

List one or two things that you did not like about working with computers during the lessons that you have been attending.

Include any general comments about your experiences in the Language Learning Center that you wish to add.

## Appendix D

### Consent Form

You are invited to participate in a study being conducted by the University of Texas at Austin on the use of computer controlled videodisc in the teaching of Spanish language material. You were selected as a participant in this study because you are in the Air Force Academy's beginning Spanish course.

You will be administered a student questionnaire at the beginning of the study. You will participate in four computer controlled Spanish lessons at the Language Learning Center over a period of two weeks. You will then be administered a similar version of the student questionnaire which you took at the onset of the study as well as a posttest covering the material in the lessons. This posttest does not count toward your grade in this course. Two weeks after the end of the study, you will be administered the same posttest once again. There are no physical risks to you during this study. In fact, you may find the experience extremely interesting and worthwhile.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission.

If you have any questions about the study, please contact Major Verano at ext. 2840.

Your signature below indicates that you are a participant in this study and that you will NOT discuss any aspect of the study with your fellow cadets until you are told by your instructor that the material is releaseable.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Appendix E

Posttest

NAME \_\_\_\_\_  
SSN \_\_\_\_\_  
GROUP # \_\_\_\_\_

ZARABANDA - POSTTEST

THIS POSTTEST IS BEING ADMINISTERED TO YOU AS PART OF A RESEARCH PROJECT UNDER DEVELOPMENT AT THE UNIVERSITY OF TEXAS AT AUSTIN. PLEASE BE AS CONSCIENTIOUS AS POSSIBLE IN MARKING YOUR ANSWERS. YOUR RESPONSES ARE CRUCIAL TO THIS RESEARCH PROJECT. YOUR COOPERATION IS GREATLY APPRECIATED.

BE SURE TO PLACE YOUR NAME AND GROUP NUMBER ON THIS TEST BOOKLET AND ON THE DIGITEK ANSWER SHEET.

## ZARABANDA I - POSTTEST

Instructions: Mark "A" for Cierto or "B" for Falso on the digitek answer sheet.

1. El protagonista de Zarabanda se llama Roberto.
2. Ramiro es comerciante.
3. La madre de Ramiro quiere una sonrisa.
4. Ramiro tiene una camisa moderna.
5. Petra dice que Ramiro es egoísta.
6. Ramiro es de Segovia.
7. Ramiro es joven.
8. Francisco tiene un Mercedes.
9. A Ramiro le gusta el dinero.
10. No hay teléfonos en Piquera.

Instructions: Choose the best answer and fill in the appropriate letter on the digitek answer sheet.

11. ¿Cómo es Piquera?
  - a. grande
  - b. pobre
  - c. siempre igual
  - d. siempre egoísta
12. La madre de Ramiro se llama . . .
  - a. Juana
  - b. Petra
  - c. Mari Trini
  - d. Maribel
13. ¿Quién quiere una sonrisa?
  - a. la madre de Ramiro
  - b. Francisco
  - c. Ramiro
  - d. Juana
14. A la madre de Ramiro . . .
  - a. le gusta la camisa de su hijo.
  - b. no le gusta la camisa de su hijo.
  - c. no le gusta Don Baldomero.



15. A Ramiro . . .
- a. no le gusta Segovia.
  - b. no le gusta Juana.
  - c. no le gusta el dinero.
  - d. no le gusta Piquera.
16. Don Baldomero dice . . .
- a. que Ramiro no es joven.
  - b. que Ramiro es joven.
  - c. que Ramiro es egoísta.
17. Ramiro quiere . . .
- a. anís.
  - b. un taxi.
  - c. oportunidades.
  - d. ir a San Esteban.
18. Francisco va a recoger a Ramiro . . .
- a. a las cinco, en el cruce de Piquera.
  - b. a las tres, en el cruce de Piquera.
  - c. a las doce, en su casa.
  - d. a las doce, en Madrid.
19. Francisco no recoge a Ramiro porque . . .
- a. está enfermo.
  - b. dice que tiene un problema y le ofrece a Ramiro ir mañana.
  - c. ya no tiene el Mercedes.
  - d. dice que se le olvidó buscar a Ramiro.
20. La madre de Ramiro le da a su hijo . . .
- a. anís.
  - b. dinero.
  - c. algo de comer.
  - d. oportunidades.
21. La madre de Ramiro le ofrece a don Baldomero . . .
- a. anís y café.
  - b. anís solamente.
  - c. coñac.
  - d. café solamente.

22. Don Baldomero . . .
- a. quiere oportunidades, quiere dinero.
  - b. prefiere café, siempre.
  - c. prefiere anís, siempre.
  - d. quiere coñac, siempre.
23. Juana . . .
- a. es joven y egoísta.
  - b. es la hermana de Ramiro.
  - c. es de Piquera de San Esteban.
  - d. es siempre igual, quiere dinero, quiere oportunidades.
24. ¿Cómo viaja Ramiro cuando se marcha de su pueblo?
- a. en tren
  - b. en coche
  - c. en camión
  - d. en autobús
25. Segovia . . .
- a. es un pueblo pequeño cerca de Piquera.
  - b. es una ciudad que está cerca de Piquera.
  - c. es donde vive el conductor del camión.
26. El viaje a Segovia es . . .
- a. aburrido.
  - b. largo.
  - c. corto.
27. El conductor del camión piensa estar . . .
- a. en Madrid a las dos.
  - b. en casa a las doce.
  - c. en Segovia a las dos.
28. ¿Qué profesión tiene Ramiro?
- a. es comerciante
  - b. es estudiante
  - c. es ingeniero
  - d. es mecánico

29. ¿Por qué va Ramiro al hotel?
- a. para buscar al dueño de la casa
  - b. para buscar una habitación
  - c. para recoger un coche que no funciona
  - d. para comer
30. ¿Qué hace el encargado del hotel cuando Ramiro llega?
- a. le enseña la habitación
  - b. le dice que el dueño no está
  - c. le explica que no hay habitaciones
  - d. escucha el radio
31. El hotel está en . . .
- a. Madrid.
  - b. Piquera de San Esteban.
  - c. Segovia.
  - d. un pueblo pequeño.
32. La habitación de Ramiro cuesta . . .
- a. diez pesetas.
  - b. cien pesetas.
  - c. cinco pesetas.
  - d. doce pesetas.
33. Una de las señoritas en la discoteca se llama . . .
- a. Petra
  - b. Juana
  - c. Maribel
  - d. Mari Trini
34. La otra señorita en la discoteca se llama . . .
- a. Juana
  - b. Petra
  - c. Irene
  - d. Mari Trini
35. Las dos señoritas en la discoteca . . .
- a. no son de Piquera, son de Madrid.
  - b. no son de Segovia, son de Madrid.
  - c. no son de Madrid, son de Segovia.
  - d. no son de Piquera ni de Segovia.

36. Las señoritas en la discoteca piensan que . . .
- a. la camisa de Ramiro es muy bonita.
  - b. la camisa de Ramiro es un poco exagerada.
  - c. Ramiro es de Segovia.
37. En el restaurante, Ramiro pide . . .
- a. chorizo y tinta.
  - b. sardinas y vino.
  - c. tortilla y vino.
38. Cuando está comiendo en el restaurante, Ramiro dice que ha estado en Segovia . . .
- a. cinco horas.
  - b. quince horas.
  - c. tres horas.
  - d. doce horas.
39. En el restaurante, Ramiro le pregunta a la señorita . . .
- a. si tiene amigos o amigas.
  - b. si ha estado en Segovia mucho tiempo.
  - c. si tiene mucho trabajo.
40. La señorita que trabaja en el restaurante . . .
- a. le da un cigarrillo a Ramiro.
  - b. le pregunta a Ramiro si tiene amigas.
  - c. le da vino blanco a Ramiro.
  - d. lleva un vestido muy largo.

## Appendix F

### Questions from Computer Lessons

The questions which follow appear in the order in which they were presented to students during programmed lessons with the computer/videodisc. The questions apply only to Groups 2 and 3, since Groups 1 and 4 were not asked any questions during their sessions with the computer/videodisc.

#### Group 2

If a student in Group 2 chose the correct answer to any of the questions in any of the showings (lessons), feedback took the form of a remark such as, "Correct." If the student chose an incorrect answer, feedback took the form of a remark such as, "Wrong." After a pause, the program automatically moved on to the next scene.

#### Group 3

The "if/then" statements and hints which follow each question below apply only to Group 3. Correct answers are highlighted. Students in this group could proceed through the lesson at their own pace, with the ability to return to areas where they had just experienced difficulty, and then move

on in the lesson. If students chose the wrong answer to a multiple choice or true/false question, they had a choice of a hint or a chance to replay the portion of film that could help them with the answer. They also had access to an Spanish/English vocabulary list. Once students chose either the hint or the replay of the film, they were shown that which was chosen followed by the same question. If they answered incorrectly again, they did not have a choice of hint or replay, but were shown the help item not yet chosen (hint or film replay). If they answered incorrectly a third time, the correct answer was provided, followed by the reason the answer was correct. In all cases, whether students chose the correct answer on the first try or not, the reason the answer was correct was provided. Students had continuous access to the vocabulary list throughout all of the showings. In case of a wrong answer for true/false questions, the screen displayed a corrective remark, a short explanatory statement, and a film replay.

First Showing (Lesson 1)

1. Ramiro no quiere una sonrisa.

a. Cierto

b. Falso

If 'a' then: Wrong! Ramiro repeatedly asks his mother for a smile.

If 'b' then: Right. He repeatedly asks his mother for a smile.

---

2. Ramiro tiene una camisa moderna.

a. Cierto

b. Falso

If 'a' then: Correct! He says so to his mother.

If 'b' then: No! You chose 'b' meaning that Ramiro didn't have a modern shirt, when in fact, he mentioned that it was modern after his mother scornfully noticed it.

---

3. Le gusta mucho la camisa a la madre de Ramiro.

a. Cierto

b. Falso

If 'a' then: Not so. She scornfully says, what a shirt!

If 'b' then: She doesn't think very highly of his shirt. You're correct.

---

4. Ramiro no quiere un café.

a. Cierto

b. Falso

If 'a' then: How right you are! He doesn't want coffee, he changes his order to cognac.

If 'b' then: This one is tricky. Ramiro first asks for coffee, but quickly changes his order to cognac. By answering 'b,' you are saying that he still wants coffee.

---

5. Ramiro tiene un Mercedes.

a. Cierto

b. Falso

If 'a' then: Ramiro doesn't have a car at all. Francisco, his friend is the one who drives his boss's Mercedes. The answer is 'b.'

If 'b' then: ¡Muy bien! Ramiro doesn't have a Mercedes. Francisco, his friend is the one who drives his boss' Mercedes.

---



6. Francisco va a recoger a Ramiro a las tres.

a. Cierto

b. Falso

If 'a' then: ¡Bien! You're a good listener.

Francisco agrees to pick up Ramiro at three.

If 'b' then: If you remember the telephone conversation, Francisco tells Ramiro where he'll pick him up and at what time.

---

7. En Piquera no hay un teléfono en la tienda.

a. Cierto

b. Falso

If 'a' then: There is a phone in the village shop.

That's where Ramiro went to talk to Francisco.

If 'b' then: Good! The only phone in Piquera is at the village shop.

Second Showing (Lesson 2)

1. Ramiro . . .

a. está con Francisco.

b. está en la tienda hablando por  
teléfono.

c. está hablando por teléfono en su casa.

If 'a' then: No. Francisco is going to give Ramiro a ride. He's not with Ramiro.

If 'b' then: You're right. Ramiro is at the village shop.

If 'c' then: Ramiro ran to the village shop to answer the phone. He has no phone at home.

Hint 1: Ramiro is where things can be bought.

Hint 2: Remember that he left his home to answer the phone in a place where things can be bought.

---

2. Don Baldomero dice que . . .

- a. Ramiro es egoísta.
- b. Ramiro no es joven.
- c. Ramiro es joven.

If 'a' then: Petra says that Ramiro is selfish, not the priest.

If 'b' then: Don Baldomero says exactly the opposite.

If 'c' then: Correct. Don Baldomero tries to ease Petra's pain of losing Ramiro.

Hint 1: Remember that young men have the urge to leave their parents.

Hint 2: Ramiro is a young man.

---

3. Petra le ofrece a don Baldomero . . .

- a. anís y café.
- b. café solamente.
- c. anís solamente.

If 'a' then: Right. Petra offers him both. He chooses 'anís.'

If 'b' then: No. Try again.

If 'c' then: No. Try again.

Hint 1: Don Baldomero prefers the better of the two.

Hint 2: If given the choice between coffee and anisette, I would always choose the latter.

---

4. ¿Cómo es Piquera?

- a. es como Segovia
- b. es pobre
- c. es como Madrid

If 'a' then: If it were, Ramiro would not want to leave it.

If 'b' then: Very good. That is precisely why Ramiro is leaving--it's so poor.

If 'c' then: If it were, Ramiro would have no intentions of leaving.

Hint 1: Piquera is not a wealthy town.

Hint 2: Judging from what we've seen so far,  
Piquera doesn't look like Acapulco.

---

5. Petra dice que Ramiro . . .

- a. quiere oportunidades.
- b. sólo quiere dinero, pero no es egoísta.
- c. sólo quiere dinero y es egoísta.

If 'a' then: Others, including Ramiro, say that he  
wants opportunities, but not Petra.

If 'b' then: The priest may agree with you, but  
not Petra.

If 'c' then: Correct. Petra makes the point that  
Ramiro is selfish and shows no concern.

Hint 1: Ramiro is looking out for 'número uno.'

Hint 2: If you're going to make it in this world,  
you have to go and get it yourself.

---

6. A Juana . . .

- a. le gusta Ramiro.
- b. le gusta el dinero.
- c. le gustan las oportunidades.

If 'a' then: This one was obvious, wasn't it?

If 'b' then: She may like money, but the story gives the impression that she's not ambitious.

If 'c' then: It's possible, but notice that she scolds Ramiro for looking for opportunities.

Hint 1: She's upset because he's leaving.

Hint 2: She is very happy where she is and cannot understand that Ramiro would want to leave.

---

7. ¿Qué le da a Ramiro su madre?

- a. anís y algo de comer
- b. coñac y algo de comer
- c. café y algo de comer
- d. anís y café y algo de comer

If 'a' then: Not so.

If 'b' then: You're right. She offered 'anís' and 'café' to don Baldomero, but did not give either one to her son.

If 'c' then: Not quite right.

If 'd' then: No, sorry.

Hint 1: One of the items is usually drunk after dinner in the U.S.

Hint 2: With that stuff for sustenance, we should be glad he's not driving.

---

8. ¿Cómo es el viaje a Segovia?

- a. corto
- b. aburrido
- c. largo

If 'a' then: Petra gives him food to take along.

That indicates a long trip.

If 'b' then: The word boring doesn't come up.

If 'c' then: For a long trip one needs a sandwich and something to drink.

Hint 1: She's packing a good lunch.

Hint 2: Judging by the full bottle, he's got a loooooong way to go.

---

9. ¿Qué busca Ramiro?

- a. la guía de teléfonos
- b. un coñac
- c. la mesa
- d. el teléfono

If 'a' then: Correct. He wants to find Francisco's number to ask him where he is.

If 'b' then: He had a cognac earlier. Now he's looking for a telephone number.

If 'c' then: He's looking for something on the table.

If 'd' then: He knows where the phone is. He's looking for something else.

Hint 1: You need this to look up phone numbers.

Hint 2: He's not asking for the Guide Michelin, we know that.

---

10. Francisco . . .

- a. dice que tiene un problema pero que va a buscar a Ramiro.
- b. dice que tiene un problema y le ofrece a Ramiro ir mañana.
- c. dice que se le olvidó buscar a Ramiro.

If 'a' then: Francisco makes all kinds of excuses why he can't give Ramiro a ride.

If 'b' then: Very good ear! He offers to pick him up the next day.

If 'c' then: Francisco may have forgotten, but that's not his excuse.

Hint 1: Not today . . .

Hint 2: Francisco's motto is: Never do today what you can put off until tomorrow.

Third Showing (Lesson 3)

1. ¿Qué es Ramiro?

- a. es comerciante
- b. es empleado de oficina
- c. es mecánico

If 'a' then: Ramiro says he is not a businessman.

If 'b' then: Ramiro doesn't say that he is an office worker.

If 'c' then: Super. He's a mechanic looking for work in a larger city.

Hint 1: Ramiro can probably fix the truck in which he's riding.

Hint 2: Would you let this man fix your Camaro?

---

2. El conductor del camión estará . . .

- a. en Madrid a las doce.
- b. en Segovia a las dos.
- c. en casa a las dos.



If 'a' then: Excellent! He'll be at home at twelve, and Madrid happens to be where he lives.

If 'b' then: The arrival time at Segovia is not mentioned, pure conjecture on your part.

If 'c' then: Wrong, but understandable. The numbers two and twelve sound alike.

Hint 1: The driver's home is Madrid.

Hint 2: They'll be in Madrid for lunch.

---

3. Ramiro quiere . . .

a. al señor de la casa.

b. una habitación.

c. oír el radio.

If 'a' then: Not a bad choice, but that's not really what he wants.

If 'b' then: Correct. He's looking for a room since he just arrived in Segovia.

If 'c' then: No. That's apparently what someone else is doing.

Hint 1: Needs a place to stay.

Hint 2: It's called a roof over one's head.

---

4. La habitación cuesta . .

- a. doce pesetas.
- b. cinco pesetas.
- c. cien pesetas.

If 'a' then: No. This number applies to something else.

If 'b' then: Sorry.

If 'c' then: Very good. One hundred 'pesetas' is correct. Cheap if you ask me!

Hint 1: Be a big spender!

Hint 2: Go for broke!

Fourth Showing (Lesson 4)

1. Ramiro pide una cerveza.

- a. Cierto
- b. Falso

If 'a' then: ¡Muy bien!

If 'b' then: Ramiro asks for a beer. The answer is 'a.'

---

2. Una de las señoritas se llama . . .

- a. Mari Trini.
- b. Maribel.
- c. Juana.
- d. Petra.

If 'a' then: This is not the name of either of the young ladies.

If 'b' then: Correct. She's the one with the long dark hair.

If 'c' then: Juana is Ramiro's girlfriend back in Piquera.

If 'd' then: Petra is Ramiro's mother.

Hint 1: The name has a certain 'ring' to it.

Hint 2: With a name like that she could be from Savannah, Georgia.

---

3. Las señoritas piensan que la camisa de Ramiro es muy bonita.

a. Cierto

b. Falso

If 'a' then: You're saying that the young ladies like Ramiro's shirt, but they thought it was rather loud. The answer is 'b.'

If 'b' then: Correct. That's some ugly shirt.

---

## 4. Las señoritas . . .

- a. son estudiantes, y son de Madrid.
- b. son estudiantes, y son de Segovia.
- c. son estudiantes, pero no son de Segovia.
- d. quieren trabajar.

If 'a' then: You're only partially correct. The young ladies are students.

If 'b' then: You're right! Both of them are students and from Segovia--"Segovianas."

If 'c' then: You're only partially correct. The young ladies are students.

If 'd' then: Ramiro wants to work, but not the young ladies.

Hint 1: Remember the name of the city in which Ramiro is right now.

Hint 2: What's a nice student from Segovia doing in a place like this?

---

5. La otra señorita se llama Irene.

- a. Cierto
- b. Falso

If 'a' then: ¡Excelente! She's the one with the short hair.

If 'b' then: Remember that the one with the long hair is Maribel. The answer is 'a.'

---

6. Ramiro quiere saber si el restaurante está abierto.

a. Cierto

b. Falso

If 'a' then: You're right. He does this in a different way by asking if it's time to close.

If 'b' then: Sorry. This is a tough one since he asks if it's time to close. The answer is 'a.'

---

7. Ramiro quiere . . .

a. hacer algo.

b. comer algo.

c. llamar por teléfono.

If 'a' then: No. Ramiro wants to do something specific.

If 'b' then: Bravo! He obviously didn't eat what his mother prepared for his trip.

If 'c' then: No. The telephone isn't mentioned at all in the conversation.

Hint 1: He entered what looks like a first class restaurant.

Hint 2: 'Bar Madrid,' one of the finest dining establishments in Segovia.

---

8. Ramiro pide . . .

- a. chorizo.
- b. sardinas.
- c. tortilla.

If 'a' then: You picked pork sausage, one of the available items, but not what he gets.

If 'b' then: You picked sardines, one of the items she mentions, but not what he gets.

If 'c' then: ¡Muy bien! Notice that 'tortilla' here is not a Mexican 'tortilla.'

Hint 1: Think chicken! Think scrambled!

Hint 2: That 'thing' on the plate used to be an egg! BELIEVE IT OR NOT!

---

9. ¿Qué le pregunta la señorita a Ramiro?

- a. si quiere ver
- b. qué es lo que quiere beber con la comida
- c. si quiere comer

If 'a' then: No. The young lady doesn't ask if he wants to see.

If 'b' then: ¡Bien! Anybody fixing terrific food like that knows that good wine goes with it.

If 'c' then: Good try, but Ramiro has already ordered something to eat.

Hint 1: What would complement this fine dish?

Hint 2: Alcohol is always good to counter the effects of dubious food items on your stomach.

---

10. Ramiro pide vino.

- a. Cierto
- b. Falso

If 'a' then: Correct. He asked for it by calling it 'tinto,' which means red wine.

If 'b' then: Sorry. Ramiro uses the word 'tinto' instead of 'vino' which is red wine. The answer is 'a.'

---

11. Ramiro le pregunta a la señorita si tiene mucho trabajo.

- a. Cierto
- b. Falso

If 'a' then: Right! He does this to make small talk while she's cleaning the tables.

If 'b' then: Ramiro asks her if there's lots of work just to talk. The answer is 'a.'

---

12. ¿Cuánto tiempo hace que Ramiro está en Segovia?

- a. quince horas
- b. dice que ahora
- c. cinco horas

If 'a' then: Wrong. He just arrived a short while ago.

If 'b' then: Sorry. This would be a possible answer but he didn't say that.

If 'c' then: Correct.

Hint 1: It's been less than 10 hours!

Hint 2: He didn't just get there.

---

13. Ramiro dice que todavía no tiene amigos o amigas.

- a. Cierto
- b. Falso

If 'a' then: Right! But you probably suspect that he'll be making friends from both sexes soon.



If 'b' then: Although Ramiro has met some people since his arrival he has no friends yet. The answer is 'a.'

## Appendix G

### Pre/Post Experiment Questionnaire Tables

Table G-1

Summary of the Results of the Pre-Experiment Questionnaire

1. What other foreign languages (besides Spanish) have you formally studied?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. French	2	4	0	2	8.6	17.3	0	8.6
b. German	0	0	2	0	0	0	8.6	0
c. Japanese	0	0	0	0	0	0	0	0
d. Chinese	0	0	0	0	0	0	0	0
e. Arabic	0	0	0	0	0	0	0	0
f. Russian	1	0	0	0	4.3	0	0	0
g. other	2	4	4	3	8.6	17.3	17.3	13.0

2. What languages other than (or besides) English do you speak at home?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. French	0	0	0	0	0	0	0	0
b. German	0	0	0	0	0	0	0	0
c. Japanese	0	0	0	0	0	0	0	0
d. Chinese	0	0	0	0	0	0	0	0
e. Arabic	0	0	0	0	0	0	0	0
f. Russian	0	0	0	0	0	0	0	0
g. other	1	1	0	0	4.3	4.3	0	0

3. What languages other than (or besides) English does your family speak at home?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. French	0	0	0	0	0	0	0	0
b. German	0	0	0	0	0	0	0	0
c. Japanese	0	0	0	0	0	0	0	0
d. Chinese	0	0	0	0	0	0	0	0
e. Arabic	0	0	0	0	0	0	0	0
f. Russian	0	0	0	0	0	0	0	0
g. other	2	1	0	2	8.6	4.3	0	8.6

(table continues)

## 4. Have you had any musical training?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Yes	12	16	18	19	52.1	67.5	79.2	82.6
b. No	11	7	5	4	47.8	30.4	21.7	17.3

## 5. If you answered 'yes' to question # 4, how long? (if 'no,' disregard)

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. 1 year	2	3	3	3	8.6	13.0	13.0	13.0
b. 2 years	2	3	4	1	8.6	13.0	17.3	4.3
c. 3 years	1	3	3	2	4.3	13.0	13.0	8.6
d. 4 years	1	3	3	5	4.3	13.0	13.0	21.7
e. 5 years	1	1	1	2	4.3	4.3	4.3	8.6
f. 6 years	0	0	1	0	0	0	4.3	0
g. 7 years	5	3	3	6	21.7	13.0	13.0	26.0

## 6. How many times have you had experience (used or played) with a computer?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Never	0	1	0	0	0	4.3	0	0
b. 1 to 10 times	0	4	3	2	0	17.3	13.0	8.6
c. 10 to 20 times	0	3	5	3	0	13.0	21.7	13.0
d. 2 to 6 months	2	1	3	5	8.6	4.3	13.0	21.7
e. 7 to 12 months	4	4	3	2	17.3	17.3	13.0	8.6
f. 1 to 2 years	6	4	6	3	26.0	17.3	26.0	13.0
g. 2 years or more	11	6	3	8	47.8	26.0	13.0	34.7

## 7. What were the main reasons (including games) for using the computer when you did use it?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Games	4	6	5	2	17.3	26.0	21.7	8.6
b. Programming	9	7	9	13	39.1	30.1	39.1	52.5
c. Word Processing	8	7	4	4	34.7	30.1	17.3	17.3
d. Learning/Educational	2	3	5	3	8.6	13.0	21.7	13.0
e. Other	0	0	0	1	0	0	0	4.3

Table continues.

## 8. How interested are you in using computers?

	NOT AT ALL				SOMEWHAT INTERESTED				VERY INTERESTED				EXTREMELY INTERESTED			
	a.				b.				c.				d.			
	(N) (by groups)				Percent (by groups)				Mean (by groups)							
Code	1	2	3	4	1	2	3	4	1	2	3	4				
a. (1)	1	2	1	0	4.3	8.7	4.3	0	3.52	3.52	3.04	3.56				
b. (2)	2	3	3	3	8.7	13.0	13.0	13.0								
c. (3)	9	6	13	8	39.1	26.1	56.5	34.8								
d. (4)	6	5	6	8	26.1	21.7	26.1	34.8								
e. (5)	5	7	0	4	21.7	30.4	0	17.4								

## 9. What interests you most about computers?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Nothing	1	1	0	0	4.5	4.5	0	0
b. Programming	7	4	1	4	31.8	18.2	4.3	17.4
c. Games	2	2	2	2	9.1	9.1	8.7	8.7
d. Word processing	1	5	7	6	4.5	22.7	30.4	26.1
e. The fact that they save time	8	4	10	7	36.4	18.2	43.5	30.4
f. The fact that they help me learn	3	4	0	3	13.6	18.2	0	13.0
g. Other	0	2	3	1	0	9.1	13.0	4.3

## 10. What interests you least about computers?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Programming	3	5	8	7	13.0	22.7	36.4	30.4
b. Using them as a learning aid	0	0	0	0	0	0	0	0
c. Operation/Mechanics	7	5	7	6	30.4	22.7	31.8	26.1
d. Nothing	12	9	6	9	52.2	40.9	27.3	39.1
e. Other	1	3	1	1	4.3	13.6	4.5	4.3

(table continues)

## 11. Do you know how to type?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Yes	19	23	18	20	82.6	100	78.2	86.9
b. No	4	0	5	3	17.3	0	21.7	13.0

## 12. How interested are you in learning Spanish?

	NOT AT ALL a.				SOMEWHAT INTERESTED b.				VERY INTERESTED c.				EXTREMELY INTERESTED d.				Mean (by groups)			
	(N) (by groups)				(N) (by groups)				Percent (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
a. (1)	0	0	0	0	0	0	0	0	3.30	3.47	3.39	3.52								
b. (2)	5	5	3	2	21.7	21.7	13.0	8.7												
c. (3)	7	6	10	10	30.4	26.1	43.5	43.5												
d. (4)	10	8	8	8	43.5	34.8	34.8	34.8												
e. (5)	1	4	2	3	4.3	17.4	8.7	13.0												

## 13. How much do you enjoy Spanish in comparison to other subjects?

	SPANISH IS MY LEAST FAVORITE a.				SPANISH IS SOMEWHAT INTERESTING b.				SPANISH IS VERY INTERESTING c.				SPANISH IS MY FAVORITE d.				Mean (by groups)			
	(N) (by groups)				(N) (by groups)				Percent (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
a. (1)	2	0	1	0	8.7	0	4.3	0	2.95	3.60	3.39	3.26								
b. (2)	4	3	4	7	17.4	13.0	17.4	30.4												
c. (3)	10	7	6	6	43.5	30.4	26.1	26.1												
d. (4)	7	11	9	7	30.4	47.8	39.1	30.4												
e. (5)	0	1	3	3	0	4.3	13.0	13.0												

(table continues)

## 14. What is your most important reason for studying Spanish?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Language learning	2	2	2	5	8.7	9.1	8.7	21.7
b. Travel	1	2	3	1	4.3	9.1	13.0	4.3
c. Credits: College/ High School	11	7	5	10	47.8	31.8	21.7	43.5
d. Future jobs	2	1	1	0	8.7	4.5	4.3	0
e. To learn about other people	0	0	0	0	0	0	0	0
f. To communicate with other people	5	9	10	5	21.7	40.9	43.5	21.7
g. Other	2	1	2	2	8.7	4.5	8.7	3.7

## 15. What are your general impressions of Spanish-speaking people?

	NEGATIVE a.				NEUTRAL b.				POSITIVE c.			
	(N) (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	4	1	3	4	17.4	4.5	13.0	17.4	2.21	2.27	2.30	2.13
b. (2)	10	14	10	12	43.5	63.6	43.5	52.2				
c. (3)	9	7	10	7	39.1	31.8	43.5	30.4				

## 16. Have you ever met or spoken to someone with a Spanish accent?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Yes	20	21	22	21	87.0	91.3	95.7	91.3
b. No	2	2	1	2	8.7	8.7	4.3	8.7

(table continues)

17. If 'yes,' where was he or she from? (if 'no,' disregard)

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Mexico	6	6	8	6	26.1	28.6	36.4	27.3
b. Spain	3	5	3	2	13.0	23.8	13.6	9.1
c. South America	4	3	5	5	17.4	14.3	22.7	22.7
d. Central America	1	0	2	1	4.3	0	9.1	4.5
e. United States	9	7	4	7	39.1	33.3	18.2	31.8
f. Other	0	0	0	1	0	0	0	4.5

18. What were your particular impressions of that person? (if you answered 'no' to question # 16, disregard this question)

				NEGATIVE		NEUTRAL		POSITIVE					
				a.		b.		c.					
(N) (by groups)				Percent (by groups)				Mean (by groups)					
Code	1	2	3	4	1	2	3	4	1	2	3	4	
a. (1)	2	1	1	3	9.1	4.8	4.5	14.3	2.45	2.61	2.54	2.38	
b. (2)	8	6	8	7	36.4	28.6	36.4	33.3					
c. (3)	12	14	13	11	54.5	66.7	59.1	52.4					

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a.	b.	c.	d.	e.

19. Spanish speakers are friendly.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	1	0	1	0	4.3	0	4.3	3.77	3.60	3.82	3.47
b. (2)	1	0	0	1	4.5	0	0	4.3				
c. (3)	7	9	8	9	30.4	39.1	34.8	39.1				
d. (4)	10	10	11	10	43.5	43.5	47.8	43.5				
e. (5)	4	3	4	2	18.2	13.0	17.4	8.7				

(table continues)

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
a.                      b.                      c.                      d.                      e.

20. I would like to have Spanish-speaking friends.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	1	0	0	0	4.3	0	0	0	3.34	3.43	3.82	3.30
b. (2)	4	2	1	3	17.4	8.7	4.3	13.0				
c. (3)	5	11	7	11	21.7	47.8	30.4	47.8				
d. (4)	12	8	10	8	52.2	34.8	43.5	34.8				
e. (5)	1	2	5	1	4.3	8.7	21.7	4.3				

21. Spanish speakers don't talk right.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	7	6	8	12	30.4	26.1	34.8	52.2	3.82	3.91	4.08	4.30
b. (4)	8	11	9	8	34.8	47.8	39.1	34.8				
c. (3)	5	4	6	1	21.7	17.4	26.1	4.3				
d. (2)	3	2	0	2	13.0	8.7	0	8.7				
e. (1)	0	0	0	0	0	0	0	0				

22. Spanish speakers are intelligent.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	0	0	0	0	0	0	0	3.52	3.17	3.43	3.26
b. (2)	1	1	2	2	4.3	4.3	8.7	8.7				
c. (3)	11	12	11	15	47.8	52.2	47.8	65.2				
d. (4)	9	8	8	4	39.1	34.8	34.8	17.4				
e. (5)	2	2	2	2	8.7	8.7	8.7	8.7				

23. Spanish speakers are lazy.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	6	4	3	3	26.1	17.4	13.0	13.0	3.65	3.73	3.21	3.69
b. (4)	6	9	7	11	26.1	39.1	30.4	47.8				
c. (3)	9	10	8	8	39.1	43.5	34.8	34.8				
d. (2)	1	0	2	1	4.3	0	8.7	4.3				
e. (1)	1	0	3	0	4.3	0	13.0	0				



STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
a.                      b.                      c.                      d.                      e.

24. I would like to visit a Spanish-speaking country.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	1	2	1	0	4.3	8.7	4.3	4.04	4.34	4.13	4.13
b. (2)	4	0	0	1	17.4	0	0	4.3				
c. (3)	2	3	2	1	8.7	13.0	8.7	4.3				
d. (4)	6	5	8	11	26.1	21.7	34.8	47.8				
e. (5)	11	14	11	9	47.8	60.9	47.8	39.1				

25. Spanish speakers are well liked in school.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	0	0	0	0	0	0	0	3.43	3.27	3.26	3.17
b. (2)	1	2	3	1	4.3	9.1	13.0	4.3				
c. (3)	13	13	12	18	56.5	59.1	52.2	78.3				
d. (4)	7	6	7	3	30.4	27.3	30.4	13.0				
e. (5)	2	1	1	1	8.7	4.5	4.3	4.3				

26. Learning Spanish will help me in my Air Force career.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	0	1	1	0	0	4.3	4.3	3.82	3.91	3.73	3.73
b. (2)	2	1	2	0	8.7	4.3	8.7	0				
c. (3)	5	6	3	6	21.7	26.1	13.0	26.1				
d. (4)	11	10	13	13	47.8	43.5	56.5	56.5				
e. (5)	5	6	4	3	21.7	26.1	17.4	13.0				

27. I want to learn Spanish to use in travel.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	1	1	1	0	4.3	4.3	4.3	3.82	3.60	3.52	3.65
b. (2)	5	3	2	1	21.7	13.0	8.7	4.3				
c. (3)	3	3	6	5	13.0	13.0	26.1	21.7				
d. (4)	6	13	12	14	26.1	56.5	52.2	60.9				
e. (5)	9	3	2	2	39.1	13.0	8.7	8.7				

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
a.                      b.                      c.                      d.                      e.

28. I want to learn Spanish in order to make new friends with Spanish speakers in this country.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	1	1	0	0	4.3	4.3	0	3.21	3.08	3.43	3.21
b. (2)	6	6	5	4	26.1	26.1	21.7	17.4				
c. (3)	7	7	5	12	30.4	30.4	21.7	52.2				
d. (4)	9	8	7	5	39.1	34.8	30.4	21.7				
e. (5)	1	1	5	2	4.3	4.3	21.7	8.7				

29. I am studying Spanish so that I can understand more about Spanish-speaking people and their culture.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	1	2	2	0	4.3	8.7	8.7	2.95	3.17	3.08	2.91
b. (2)	9	6	3	7	39.1	26.1	13.0	30.4				
c. (3)	7	6	9	7	30.4	26.1	39.1	30.4				
d. (4)	6	8	9	5	26.1	34.8	39.1	21.7				
e. (5)	1	2	0	2	4.3	8.7	0	8.7				

30. I enjoy using computers to learn new material.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	1	1	0	2	4.5	4.5	0	8.7	3.86	3.81	3.73	3.82
b. (2)	1	1	0	0	4.5	4.5	0	0				
c. (3)	2	4	7	4	9.1	18.2	30.4	17.4				
d. (4)	14	11	15	11	63.6	50.0	65.2	47.8				
e. (5)	4	5	1	6	18.2	22.7	4.3	26.1				

(table continues)

:STRONGLY :  
:DISAGREE :DISAGREE: NEUTRAL :AGREE :STRONGLY:  
a. b. c. d. e.

31. I prefer learning a foreign language from an instructor.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	0	0	0	0	0	0	0	0	2.45	2.00	2.47	2.52
b. (4)	1	0	0	1	4.5	0	0	4.3				
c. (3)	11	6	14	14	50.0	26.1	60.9	60.9				
d. (2)	7	11	6	4	31.8	47.8	26.1	17.4				
e. (1)	3	6	3	4	13.6	26.1	13.0	17.4				

32. I prefer studying language with other students around.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	0	0	0	1	0	0	0	4.3	2.22	1.91	2.21	2.30
b. (4)	2	0	1	1	9.1	0	4.3	4.3				
c. (3)	7	5	6	6	31.8	21.7	26.1	26.1				
d. (2)	7	11	13	11	31.8	47.8	56.5	47.8				
e. (1)	6	7	3	4	27.3	30.4	13.0	17.4				

33. I prefer studying a foreign language in a classroom setting.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	0	0	0	0	0	0	0	0	2.30	2.21	2.52	2.65
b. (4)	0	0	1	0	0	0	4.3	0				
c. (3)	10	8	11	16	43.5	34.8	47.8	69.6				
d. (2)	10	12	10	6	43.5	52.2	43.4	26.1				
e. (1)	3	3	1	1	13.0	13.0	4.3	4.3				

34. I prefer having a textbook when I study language.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	0	0	0	0	0	0	0	0	2.22	2.31	2.50	2.34
b. (4)	3	0	1	0	13.6	0	4.5	0				
c. (3)	3	12	12	11	13.6	54.5	54.5	47.8				
d. (2)	12	5	6	9	54.5	22.7	27.3	39.1				
e. (1)	4	5	3	3	18.2	22.7	13.6	13.0				

Table G-2

Summary of the Results of the Post-Experiment Attitudinal Questionnaire

## 1. How interested are you in using computers?

	NOT AT ALL				SOMEWHAT INTERESTED				VERY INTERESTED				EXTREMELY INTERESTED			
	a.				b.				c.				d.			
	(N) (by groups)				Percent (by groups)				Mean (by groups)							
Code	1	2	3	4	1	2	3	4	1	2	3	4				
a. (1)	1	1	1	0	4.3	4.3	4.3	0	3.69	3.43	2.95	3.39				
b. (2)	0	5	6	4	0	21.7	26.1	17.4								
c. (3)	9	6	10	9	39.1	26.1	43.5	39.1								
d. (4)	8	5	5	7	34.8	21.7	21.7	30.4								
e. (5)	5	6	1	3	21.7	26.1	4.3	13.0								

## 2. What interests you most about computers?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Nothing	1	0	0	0	4.3	0	0	0
b. Programming	5	5	0	4	21.7	21.7	0	17.4
c. Games	1	3	2	2	4.3	13.0	9.1	8.7
d. Word processing	5	5	5	5	21.7	21.7	22.7	21.7
e. The fact that they save time	7	6	11	8	30.4	26.1	50.0	34.8
f. The fact that they help me learn	3	2	3	2	13.0	8.7	13.0	8.7
g. Other	1	2	1	2	4.3	8.7	4.5	8.7

## 3. What interests you least about computers?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Programming	4	6	12	6	17.4	26.1	52.2	26.1
b. Using them as a learning aid	1	1	0	2	4.3	4.3	0	8.7
c. Operation/Mechanics	6	5	5	7	26.1	21.7	21.7	30.4
d. Nothing	8	10	5	6	34.8	43.5	21.7	26.1
e. Other	4	1	1	2	17.4	4.3	4.3	8.7

table continues

## 4. How interested are you in learning Spanish?

	: NOT AT ALL :				: SOMEWHAT INTERESTED :				: VERY INTERESTED :				: EXTREMELY INTERESTED :			
	a.				b.				c.				d.			
	(N)				Percent				Mean				(by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4				
a. (1)	1	1	0	0	4.3	4.3	0	0	3.13	3.39	3.69	3.39				
b. (2)	6	3	3	5	26.1	13.0	13.0	21.7								
c. (3)	6	8	5	8	26.1	34.8	21.7	34.8								
d. (4)	9	8	11	6	39.1	34.8	47.8	26.1								
e. (5)	1	3	4	4	4.3	13.0	17.4	17.4								

## 5. How much do you enjoy Spanish in comparison to other subjects?

	: SPANISH IS MY LEAST FAVORITE :				: SPANISH IS SOMEWHAT INTERESTING :				: SPANISH IS VERY INTERESTING :				: SPANISH IS MY FAVORITE :			
	a.				b.				c.				d.			
	(N)				Percent				Mean				(by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4				
a. (1)	2	3	1	2	8.7	13.0	4.3	8.7	3.04	3.17	3.69	3.00				
b. (2)	4	2	2	5	17.4	8.7	8.7	21.7								
c. (3)	9	9	4	9	39.1	39.1	17.4	39.1								
d. (4)	7	6	12	5	30.4	26.1	52.2	21.7								
e. (5)	1	3	4	2	4.3	13.0	17.4	8.7								

## 6. What is your most important reason for studying Spanish?

	(N)				Percent			
	(by groups)				(by groups)			
	1	2	3	4	1	2	3	4
a. Language learning	1	3	1	3	4.5	13.0	4.3	13.6
b. Travel	2	2	4	1	9.1	8.7	17.4	4.5
c. Credits: College/High School	11	9	6	9	50.0	39.1	26.4	40.9
d. Future jobs	2	2	0	0	9.1	8.7	0	0
e. To learn about other people	1	0	1	0	4.5	0	4.3	0
f. To communicate with other people	4	7	10	9	18.2	30.4	43.5	40.9
g. Other	1	0	1	0	4.5	0	4.3	0

(table continues)

## 7. What are your general impressions of Spanish-speaking people?

Code	NEGATIVE				NEUTRAL				POSITIVE			
	a.				b.				c.			
	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	1	1	4	2	4.3	4.3	17.4	8.7	2.43	2.21	2.34	2.26
b. (2)	11	16	8	16	47.8	69.6	34.7	69.6				
c. (3)	11	6	11	5	47.8	26.1	47.8	21.7				

## 8. Have you ever met or spoken to someone with a Spanish accent?

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Yes	22	22	23	21	95.7	95.7	100	91.3
b. No	1	1	0	2	4.3	4.3	0	8.7

## 9. If 'yes,' where was he or she from? (if 'no,' disregard)

	(N) (by groups)				Percent (by groups)			
	1	2	3	4	1	2	3	4
a. Mexico	7	7	9	8	33.3	31.8	39.1	36.4
b. Spain	2	4	3	4	9.5	18.2	13.0	18.2
c. South America	2	4	4	4	9.5	18.2	17.4	18.2
d. Central America	1	0	3	1	4.8	0	13.0	4.5
e. United States	6	7	3	4	28.6	31.8	13.0	18.2
f. Other	3	0	1	1	14.3	0	4.3	4.5

## 10. What were your particular impressions of that person? (if you answered 'no' to question # 16, disregard this question)

Code	NEGATIVE				NEUTRAL				POSITIVE			
	a.				b.				c.			
	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	2	0	0	2	9.1	0	0	9.1	2.54	2.54	2.65	2.63
b. (2)	6	10	8	6	27.3	45.5	34.8	27.3				
c. (3)	14	12	15	14	63.6	54.5	65.2	59.3				

(table continues)

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
a.                      b.                      c.                      d.                      e.

## 11. Spanish speakers are friendly.

	(N) (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	0	0	0	0	0	0	0	3.73	3.30	3.73	3.47
b. (2)	1	1	1	2	4.3	4.3	4.3	8.7				
c. (3)	6	14	7	9	26.1	60.9	30.4	39.1				
d. (4)	14	8	12	11	60.9	34.8	52.2	47.8				
e. (5)	2	0	3	1	8.7	0	13.0	4.3				

## 12. I would like to have Spanish-speaking friends.

	(N) (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	1	0	0	0	4.3	0	0	3.69	3.52	3.82	3.43
b. (2)	0	1	1	1	0	4.3	4.3	4.3				
c. (3)	9	9	7	13	39.1	39.1	30.4	56.5				
d. (4)	12	9	10	7	52.2	39.1	43.5	30.4				
e. (5)	2	3	5	2	8.7	13.0	21.7	8.7				

## 13. Spanish speakers don't talk right.

	(N) (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	8	10	8	8	34.8	43.5	34.8	34.8	4.13	4.13	4.00	4.04
b. (4)	11	7	8	9	47.8	30.4	34.8	39.1				
c. (3)	3	5	6	5	13.0	21.7	26.1	21.7				
d. (2)	1	1	1	1	4.3	4.3	4.3	4.3				
e. (1)	0	0	0	0	0	0	0	0				

## 14. Spanish speakers are intelligent.

	(N) (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	0	0	1	0	0	0	4.3	3.47	3.43	3.34	3.26
b. (2)	1	0	2	2	4.3	0	8.7	8.7				
c. (3)	13	14	12	12	56.5	60.9	52.2	52.2				
d. (4)	6	8	8	6	26.1	34.8	34.8	26.1				
e. (5)	3	1	1	2	13.0	4.3	4.3	8.7				

STRONGLY :  
DISAGREE : DISAGREE : NEUTRAL : AGREE : STRONGLY :  
a. b. c. d. e.

15. Spanish speakers are lazy.

	(N) (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	3	2	4	4	13.6	8.7	17.4	17.4	3.36	3.34	3.56	3.39
b. (4)	5	7	8	5	22.7	30.4	34.8	21.7				
c. (3)	11	12	8	11	50.0	52.2	34.8	47.8				
d. (2)	3	1	3	2	13.6	4.3	13.0	8.7				
e. (1)	0	1	0	1	0	4.3	0	4.3				

16. I would like to visit a Spanish-speaking country.

	(N) (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	0	0	0	0	0	0	0	3.91	4.34	4.43	4.00
b. (2)	2	1	0	3	8.7	4.3	0	13.0				
c. (3)	5	3	2	3	21.7	13.0	8.7	13.0				
d. (4)	9	6	9	8	39.1	26.1	39.1	34.8				
e. (5)	7	13	12	9	30.4	56.5	52.2	39.1				

17. Spanish speakers are well liked in school.

	(N) (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	1	1	0	0	4.3	4.3	0	3.30	3.04	3.17	3.26
b. (2)	1	0	0	0	4.3	0	0	0				
c. (3)	15	20	16	18	65.2	87.0	69.6	78.3				
d. (4)	6	1	6	4	26.1	4.3	26.1	17.4				
e. (5)	1	1	0	1	4.3	4.3	0	4.3				

18. Learning Spanish will help me in my Air Force career.

	(N) (by groups)				Percent (by groups)				Mean (by groups)			
Code	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	0	0	0	0	0	0	0	3.73	3.82	3.74	3.91
b. (2)	3	1	4	1	13.0	4.3	18.2	4.3				
c. (3)	2	7	3	5	8.7	30.4	13.6	21.7				
d. (4)	16	10	10	12	69.6	43.5	45.5	52.2				
e. (5)	2	5	5	5	8.7	21.7	22.7	21.7				



STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a.	b.	c.	d.	e.

19. I want to learn Spanish to use in travel.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	1	0	0	0	4.3	0	0	3.60	3.60	4.00	3.73
b. (2)	3	5	3	2	13.0	21.7	13.0	8.7				
c. (3)	5	1	2	5	21.7	4.3	8.7	21.7				
d. (4)	13	11	10	13	56.5	47.8	43.5	56.5				
e. (5)	2	5	8	3	8.7	21.7	34.8	13.0				

20. I want to learn Spanish in order to make new friends with Spanish speakers in this country.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	2	0	0	0	8.7	0	0	3.13	3.26	3.52	3.34
b. (2)	6	4	5	2	26.0	17.4	21.7	8.7				
c. (3)	9	8	6	12	39.1	34.8	26.1	52.2				
d. (4)	7	4	7	8	30.4	17.4	30.4	34.8				
e. (5)	1	5	5	1	4.3	21.7	21.7	4.3				

21. I am studying Spanish so that I can understand more about Spanish-speaking people and their culture.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	2	0	1	0	8.7	0	4.3	3.00	3.43	3.26	3.13
b. (2)	7	4	5	4	30.4	17.4	21.7	17.4				
c. (3)	10	2	8	9	43.5	8.7	34.8	39.1				
d. (4)	5	12	9	9	21.7	52.2	39.1	39.1				
e. (5)	1	3	1	0	4.3	13.0	4.3	0				

(table continues)

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
a.                      b.                      c.                      d.                      e.

22. I enjoy using computers to learn new material.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	1	2	0	0	4.3	8.7	0	0	3.82	3.52	3.91	3.87
b. (2)	0	1	0	2	0	4.3	0	8.7				
c. (3)	4	8	4	3	17.4	34.8	17.4	13.0				
d. (4)	15	7	17	14	65.2	30.4	73.9	60.9				
e. (5)	3	5	2	4	13.0	21.7	8.7	17.4				

23. I prefer learning a foreign language from an instructor.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	0	0	0	1	0	0	0	4.3	2.21	2.13	2.65	2.30
b. (4)	0	1	1	1	0	4.3	4.3	4.3				
c. (3)	8	6	15	7	34.8	26.1	65.2	30.4				
d. (2)	12	11	5	9	52.2	47.8	21.7	39.1				
e. (1)	3	5	2	5	13.0	21.7	8.7	21.7				

24. I prefer studying language with other students around.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	0	1	0	0	0	4.3	0	0	2.08	2.13	2.39	2.08
b. (4)	1	0	5	2	4.3	0	21.7	8.7				
c. (3)	5	5	2	7	21.7	21.7	8.7	30.4				
d. (2)	12	12	13	5	52.2	52.2	56.5	21.7				
e. (1)	5	5	3	9	21.7	21.7	13.0	39.1				

25. I prefer studying a foreign language in a classroom setting.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	0	0	0	1	0	0	0	4.3	2.47	2.17	2.43	2.47
b. (4)	2	1	3	1	8.7	4.3	13.0	4.3				
c. (3)	10	7	8	10	43.5	30.4	34.8	43.5				
d. (2)	8	10	8	7	34.8	43.5	34.8	30.4				
e. (1)	3	5	4	4	13.0	21.7	17.4	17.4				

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
a.                      b.                      c.                      d.                      e.

26. I prefer having a textbook when I study language.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	0	0	0	0	0	0	0	0	2.27	2.08	2.52	2.19
b. (4)	0	0	3	1	0	0	14.3	4.8				
c. (3)	8	7	6	7	36.4	30.4	28.6	33.3				
d. (2)	12	11	11	8	54.5	47.8	52.4	38.1				
e. (1)	2	5	1	5	9.1	21.7	4.8	23.8				

27. I did not enjoy the fact that I had no control over the lesson.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	--	--	--	0	--	--	--	3.54	--	--	--
b. (2)	3	--	--	--	13.6	--	--	--				
c. (3)	7	--	--	--	31.8	--	--	--				
d. (4)	9	--	--	--	40.9	--	--	--				
e. (5)	3	--	--	--	13.6	--	--	--				

28. I felt the material presented was the right level for my abilities.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	4	--	--	--	19.0	--	--	--	2.57	--	--	--
b. (2)	7	--	--	--	33.3	--	--	--				
c. (3)	4	--	--	--	19.0	--	--	--				
d. (4)	6	--	--	--	28.6	--	--	--				
e. (5)	0	--	--	--	0	--	--	--				

29. I missed being able to 'speak' the language.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	--	--	--	0	--	--	--	3.42	--	--	--
b. (2)	3	--	--	--	14.3	--	--	--				
c. (3)	7	--	--	--	33.3	--	--	--				
d. (4)	10	--	--	--	47.6	--	--	--				
e. (5)	1	--	--	--	4.8	--	--	--				

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a.	b.	c.	d.	e.

30. I felt that the video helped me understand what was being said.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	--	--	--	0	--	--	--	3.71	--	--	--
b. (2)	4	--	--	--	19.0	--	--	--				
c. (3)	3	--	--	--	14.3	--	--	--				
d. (4)	9	--	--	--	42.9	--	--	--				
e. (5)	5	--	--	--	23.8	--	--	--				

31. I wish I could have had control of the lesson.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	0	--	--	--	0	--	--	--	4.00	--	--	--
b. (2)	0	--	--	--	0	--	--	--				
c. (3)	4	--	--	--	19.0	--	--	--				
d. (4)	13	--	--	--	61.9	--	--	--				
e. (5)	4	--	--	--	19.0	--	--	--				

32. I did not enjoy the fact that I had no control over the lesson.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	2	--	--	--	8.7	--	--	--	3.30	--	--
b. (2)	--	7	--	--	--	30.4	--	--				
c. (3)	--	2	--	--	--	8.7	--	--				
d. (4)	--	6	--	--	--	26.1	--	--				
e. (5)	--	6	--	--	--	26.1	--	--				

33. I felt the material presented was the right level for my abilities.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	1	--	--	--	4.3	--	--	--	2.37	--	--
b. (2)	--	8	--	--	--	34.8	--	--				
c. (3)	--	7	--	--	--	30.4	--	--				
d. (4)	--	7	--	--	--	30.4	--	--				
e. (5)	--	0	--	--	--	0	--	--				

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
a.                      b.                      c.                      d.                      e.

34. I missed being able to 'speak' the language.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	1	--	--	--	4.3	--	--	--	3.52	--	--
b. (2)	--	3	--	--	--	13.0	--	--	--			
c. (3)	--	6	--	--	--	26.1	--	--	--			
d. (4)	--	9	--	--	--	39.1	--	--	--			
e. (5)	--	4	--	--	--	17.4	--	--	--			

35. I did not enjoy being asked questions by the computer and not being given the correct answers afterwards whenever I answered incorrectly.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	1	--	--	--	4.3	--	--	--	4.13	--	--
b. (2)	--	1	--	--	--	4.3	--	--	--			
c. (3)	--	3	--	--	--	13.0	--	--	--			
d. (4)	--	7	--	--	--	30.4	--	--	--			
e. (5)	--	11	--	--	--	47.8	--	--	--			

36. I wish I could have had control of the lesson.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	1	--	--	--	4.3	--	--	--	3.82	--	--
b. (2)	--	2	--	--	--	8.7	--	--	--			
c. (3)	--	4	--	--	--	17.4	--	--	--			
d. (4)	--	9	--	--	--	39.1	--	--	--			
e. (5)	--	7	--	--	--	30.4	--	--	--			

(table continues)

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a.	b.	c.	d.	e.

37. I felt the material presented was the right level for my abilities.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	2	--	--	--	8.7	--	--	--	3.30	--
b. (2)	--	--	4	--	--	--	17.4	--	--	--		
c. (3)	--	--	3	--	--	--	13.0	--	--	--		
d. (4)	--	--	13	--	--	--	56.5	--	--	--		
e. (5)	--	--	1	--	--	--	4.3	--	--	--		

38. I missed being able to 'speak' the language.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	0	--	--	--	0	--	--	--	3.43	--
b. (2)	--	--	5	--	--	--	21.7	--	--	--		
c. (3)	--	--	6	--	--	--	26.1	--	--	--		
d. (4)	--	--	9	--	--	--	39.1	--	--	--		
e. (5)	--	--	3	--	--	--	13.0	--	--	--		

39. I enjoyed the one-on-one nature of the interactive videodisc system.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	0	--	--	--	0	--	--	--	3.91	--
b. (2)	--	--	0	--	--	--	0	--	--	--		
c. (3)	--	--	5	--	--	--	21.7	--	--	--		
d. (4)	--	--	15	--	--	--	65.2	--	--	--		
e. (5)	--	--	3	--	--	--	13.0	--	--	--		

(table continues)

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a.	b.	c.	d.	e.

40. I found that time passed very quickly while using the interactive videodisc system.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	1	--	--	--	4.3	--	--	--	4.39	--
b. (2)	--	--	0	--	--	--	0	--	--	--	--	--
c. (3)	--	--	0	--	--	--	0	--	--	--	--	--
d. (4)	--	--	10	--	--	--	43.5	--	--	--	--	--
e. (5)	--	--	12	--	--	--	52.2	--	--	--	--	--

41. I would recommend interactive videodisc learning to other beginning language students.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	0	--	--	--	0	--	--	--	4.34	--
b. (2)	--	--	2	--	--	--	8.7	--	--	--	--	--
c. (3)	--	--	0	--	--	--	0	--	--	--	--	--
d. (4)	--	--	9	--	--	--	39.1	--	--	--	--	--
e. (5)	--	--	12	--	--	--	52.2	--	--	--	--	--

42. I used the student control options frequently.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	1	--	--	--	4.3	--	--	--	3.21	--
b. (2)	--	--	5	--	--	--	21.7	--	--	--	--	--
c. (3)	--	--	6	--	--	--	26.1	--	--	--	--	--
d. (4)	--	--	10	--	--	--	43.5	--	--	--	--	--
e. (5)	--	--	1	--	--	--	4.3	--	--	--	--	--

(table continues)

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a.	b.	c.	d.	e.

43. I understood what the important parts of the lesson were.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	0	--	--	--	0	--	--	--	3.56	--
b. (2)	--	--	3	--	--	--	13.0	--	--	--		
c. (3)	--	--	5	--	--	--	21.7	--	--	--		
d. (4)	--	--	14	--	--	--	60.9	--	--	--		
e. (5)	--	--	1	--	--	--	4.3	--	--	--		

44. I didn't like having to respond to every question.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (5)	--	--	0	--	--	--	0	--	--	--	3.56	--
b. (4)	--	--	16	--	--	--	69.6	--	--	--		
c. (3)	--	--	4	--	--	--	17.4	--	--	--		
d. (2)	--	--	2	--	--	--	13.0	--7	--	--		
e. (1)	--	--	0	--	--	--	0	--	--	--		

45. I found the student control option 'replay' useful.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	1	--	--	--	4.3	--	--	--	3.95	--
b. (2)	--	--	1	--	--	--	4.3	--	--	--		
c. (3)	--	--	2	--	--	--	8.7	--	--	--		
d. (4)	--	--	13	--	--	--	56.5	--	--	--		
e. (5)	--	--	6	--	--	--	25.1	--	--	--		

TABLE 2. CONTINUED



NO-A105 093

ACHIEVEMENT AND RETENTION OF SPANISH PRESENTED VIA  
VIDEODISC IN LINEAR SE. (U) AIR FORCE INST OF TECH  
WRIGHT-PATTESSON AFB OH 4 VERANO 1987  
AFIT/CI/NR-87-117D

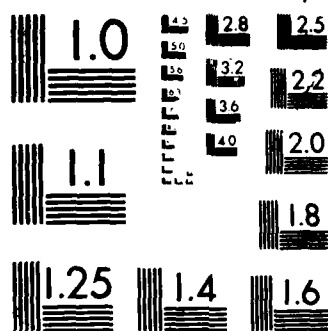
3/3

UNCLASSIFIED

F/G 5/8

NL

END  
DATE  
INDEXED  
FILED



MICROCOPY RESOLUTION TEST CHART  
 NATIONAL BUREAU OF STANDARDS-1963-A

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
a.                      b.                      c.                      d.                      e.

46. I liked getting feedback every time I made a response.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	0	--	--	--	0	--	--	--	4.50	--
b. (2)	--	--	1	--	--	--	4.5	--	--	--		
c. (3)	--	--	1	--	--	--	4.5	--	--	--		
d. (4)	--	--	6	--	--	--	27.3	--	--	--		
e. (5)	--	--	14	--	--	--	63.6	--	--	--		

47. I liked being able to go back to a portion of the lesson that I did not understand.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	0	--	--	--	0	--	--	--	4.36	--
b. (2)	--	--	1	--	--	--	4.5	--	--	--		
c. (3)	--	--	0	--	--	--	0	--	--	--		
d. (4)	--	--	11	--	--	--	50.0	--	--	--		
e. (5)	--	--	10	--	--	--	45.5	--	--	--		

48. I did not enjoy the fact that I had no control over the lesson.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	--	1	--	--	--	4.3	--	--	--	3.56
b. (2)	--	--	--	4	--	--	--	17.4	--	--	--	
c. (3)	--	--	--	3	--	--	--	13.0	--	--	--	
d. (4)	--	--	--	11	--	--	--	47.8	--	--	--	
e. (5)	--	--	--	4	--	--	--	17.4	--	--	--	

(table continues)

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a.	b.	c.	d.	e.

49. I felt the material presented was the right level for my abilities.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	--	0	--	--	--	0	--	--	--	3.95
b. (2)	--	--	--	0	--	--	--	0				
c. (3)	--	--	--	3	--	--	--	21.7				
d. (4)	--	--	--	14	--	--	--	68.9				
e. (5)	--	--	--	4	--	--	--	17.4				

50. I missed being able to 'speak' the language.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	--	0	--	--	--	0	--	--	--	3.60
b. (2)	--	--	--	3	--	--	--	13.0				
c. (3)	--	--	--	7	--	--	--	30.4				
d. (4)	--	--	--	9	--	--	--	39.1				
e. (5)	--	--	--	4	--	--	--	17.4				

51. I felt that the posttest had nothing to do with what I was shown on the computer monitor.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	--	0	--	--	--	0	--	--	--	1.65
b. (2)	--	--	--	0	--	--	--	0				
c. (3)	--	--	--	2	--	--	--	8.7				
d. (4)	--	--	--	4	--	--	--	17.4				
e. (5)	--	--	--	17	--	--	--	73.9				

(table continues)

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
a.	b.	c.	d.	e.

52. I did not enjoy the repetition of the lesson.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	--	2	--	--	--	8.7	--	--	--	2.91
b. (2)	--	--	--	4	--	--	--	17.4				
c. (3)	--	--	--	12	--	--	--	52.2				
d. (4)	--	--	--	4	--	--	--	17.4				
e. (5)	--	--	--	1	--	--	--	4.3				

53. I wish I could have had control of the lesson.

Code	(N) (by groups)				Percent (by groups)				Mean (by groups)			
	1	2	3	4	1	2	3	4	1	2	3	4
a. (1)	--	--	--	0	--	--	--	0	--	--	--	3.87
b. (2)	--	--	--	0	--	--	--	0				
c. (3)	--	--	--	8	--	--	--	34.8				
d. (4)	--	--	--	10	--	--	--	43.5				
e. (5)	--	--	--	5	--	--	--	21.7				

Table G-3

Comparison of Selected Questions from the Pre and Post-Experiment  
Attitudinal Questionnaire

How interested are you in using computers?

	NOT AT ALL 1	SOMEWHAT INTERESTED 2	INTERESTED 3	VERY INTERESTED 4	EXTREMELY INTERESTED 5
	Mean (by groups)				
Attitudinal Questionnaire	1	2	3	4	
Pre-Experiment Results	3.52	3.52	3.04	3.56	
Post-Experiment Results	3.69	3.43	2.95	3.39	

How interested are you in learning Spanish?

	NOT AT ALL 1	SOMEWHAT INTERESTED 2	INTERESTED 3	VERY INTERESTED 4	EXTREMELY INTERESTED 5
	Mean (by groups)				
Attitudinal Questionnaire	1	2	3	4	
Pre-Experiment Results	3.30	3.47	3.39	3.52	
Post-Experiment Results	3.13	3.39	3.69	3.39	

How much do you enjoy Spanish in comparison to other subjects?

	SPANISH IS MY LEAST FAVORITE 1	SPANISH IS SOMEWHAT INTERESTING 2	SPANISH IS INTERESTING 3	SPANISH IS VERY INTERESTING 4	SPANISH IS MY FAVORITE 5
	Mean (by groups)				
Attitudinal Questionnaire	1	2	3	4	
Pre-Experiment Results	2.95	3.60	3.39	3.26	
Post-Experiment Results	3.04	3.17	3.49	3.00	

(table continues)

What are your general impressions of Spanish-speaking people?

NEGATIVE      NEUTRAL      POSITIVE  
1                      2                      3

	Mean (by groups)			
Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	2.21	2.27	2.30	2.13
Post-Experiment Results	2.43	2.21	2.34	2.26
Spanish speakers are friendly.				

STRONGLY      DISAGREE      DISAGREE      NEUTRAL      AGREE      STRONGLY  
DISAGREE      DISAGREE      NEUTRAL      AGREE      AGREE  
1                      2                      3                      4                      5

	Mean (by groups)			
Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.77	3.60	3.82	3.47
Post-Experiment Results	3.73	3.30	3.73	3.47
I would like to have Spanish-speaking friends.				

STRONGLY      DISAGREE      DISAGREE      NEUTRAL      AGREE      STRONGLY  
DISAGREE      DISAGREE      NEUTRAL      AGREE      AGREE  
1                      2                      3                      4                      5

	Mean (by groups)			
Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.34	3.43	3.82	3.30
Post-Experiment Results	3.69	3.52	3.82	3.43

(table continues)

Spanish speakers don't talk right.

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5	4	3	2	1

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.82	3.91	4.08	4.30
Post-Experiment Results	4.13	4.13	4.00	4.04

Spanish speakers are intelligent.

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
1	2	3	4	5

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.52	3.47	3.43	3.26
Post-Experiment Results	3.47	3.43	3.34	3.26

Spanish speakers are lazy.

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5	4	3	2	1

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.65	3.73	3.21	3.69
Post-Experiment Results	3.36	3.34	3.56	3.39

(table continues)



I would like to visit a Spanish-speaking country.

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
1                      2                      3                      4                      5

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	4.04	4.34	4.13	4.13
Post-Experiment Results	3.91	4.34	4.43	4.00

Spanish speakers are well liked in school.

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
1                      2                      3                      4                      5

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.43	3.27	3.26	3.17
Post-Experiment Results	3.30	3.04	3.17	3.26

Learning Spanish will help me in my Air Force career.

STRONGLY DISAGREE   DISAGREE   NEUTRAL   AGREE   STRONGLY AGREE  
1                      2                      3                      4                      5

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.82	3.91	3.73	3.73
Post-Experiment Results	3.73	3.82	3.74	3.91

(table continues)

I want to learn Spanish to use in travel.

STRONGLY :  
DISAGREE : DISAGREE : NEUTRAL : AGREE : STRONGLY :  
1 2 3 4 5

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.82	3.60	3.52	3.65
Post-Experiment Results	3.60	3.60	4.00	3.73

I want to learn Spanish in order to make new friends with Spanish speakers in this country.

STRONGLY :  
DISAGREE : DISAGREE : NEUTRAL : AGREE : STRONGLY :  
1 2 3 4 5

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.21	3.08	3.43	3.21
Post-Experiment Results	3.13	3.26	3.52	3.34

I am studying Spanish so that I can understand more about Spanish-speaking people and their culture.

STRONGLY :  
DISAGREE : DISAGREE : NEUTRAL : AGREE : STRONGLY :  
1 2 3 4 5

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	2.95	3.17	3.08	2.91
Post-Experiment Results	3.00	3.43	3.26	3.13

(table continues)

I enjoy using computers to learn new material.

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
1	2	3	4	5

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	3.86	3.81	3.73	3.32
Post-Experiment Results	3.82	3.52	3.91	3.87

I prefer learning a foreign language from an instructor.

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5	4	3	2	1

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	2.45	2.00	2.47	2.52
Post-Experiment Results	2.21	2.13	2.65	2.30

I prefer studying language with other students around.

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5	4	3	2	1

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	2.22	1.91	2.21	2.30
Post-Experiment Results	2.08	2.13	2.39	2.08

(table continues)

I prefer studying a foreign language in a classroom setting.

STRONGLY				STRONGLY
DISAGREE	DISAGREE	NEUTRAL	AGREE	AGREE
5	4	3	2	1

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	2.30	2.21	2.52	2.65
Post-Experiment Results	2.47	2.17	2.43	2.47

I prefer having a textbook when I study language.

STRONGLY				STRONGLY
DISAGREE	DISAGREE	NEUTRAL	AGREE	AGREE
5	4	3	2	1

Mean  
(by groups)

Attitudinal Questionnaire	1	2	3	4
Pre-Experiment Results	2.22	2.31	2.50	2.34
Post-Experiment Results	2.27	2.08	2.52	2.19

## Appendix H

### Vocabulary List

The vocabulary list applies only to Group 3.

Students in this group had access to the entire list at all times, except when the videodisc was being shown.

abierto -----	open
adiós -----	good-bye (also a greeting in Spain)
algo más -----	something else
anís -----	anisette (drink)
bolsillo -----	pocket
bonita -----	pretty
bueno -----	good, alright
buscar -----	to look for (to pick up something or someone)
camión -----	truck
cerrado -----	closed
chorizo -----	pork sausage
comerciante -----	businessman
cuesta -----	it costs
dar -----	to give
derecha -----	right
don -----	title before male Christian name
egoísta -----	selfish
empleado de oficina -----	office worker
es como -----	it's like
exagerada -----	exaggerated (flashy, wild)
fuego -----	light (for tobacco)
gente -----	people
gustar -----	to like
habitación -----	room
hora -----	time
igual -----	the same
izquierda -----	left
joven -----	young

largo -----	long
mecánico -----	mechanic
mundo -----	world
ofrecer -----	to offer
olvidar -----	to forget
por favor -----	please
preferir -----	to prefer
preguntar -----	to ask
querer -----	to want
recoger -----	to pick up
sardinas -----	sardines
siempre -----	always
solamente -----	only (long version)
sólo -----	only (short version)
somos de aquí -----	we're from here
sonrisa -----	smile
soy de -----	I come from . . .
tiempo -----	time
tienda -----	shop, store
tiene -----	he, she or it has
tortilla -----	omelette
trabajar -----	to work
un coñac -----	a brandy
un momento difícil -----	a difficult moment
un pijama -----	a pair of pajamas
una camisa moderna -----	a modern shirt
una llamada telefónica -----	a telephone call
una toalla -----	a towel
viaje -----	trip

## Appendix I

### Zarabanda Dialogue

#### First Scene

The scene takes place in Piquera de San Esteban, a small village in Spain. Ramiro's mother, Petra, is ironing things for her son who plans to leave to find work in another city. He stops packing his suitcase and approaches his mother.

Ramiro ¡Por favor, madre! Quiero un pijama.

Petra (Hands him a pair of pajamas) Un pijama. (Ramiro looks through the clothes)

Ramiro Quiero una toalla. (Petra gives him a towel)

Petra Una toalla. ¿Algo más?

Ramiro Sí, quiero algo más. Quiero una sonrisa. Quiero una sonrisa, madre. ¡Por favor!

Petra (Unfolds a fancy shirt) ¡Qué camisa!

Ramiro Una camisa moderna . . . (A young boy calls him to the telephone at the shop)

---

Ramiro enters and picks up the phone. Someone will be picking him up by car shortly.

Ramiro ¿Francisco? . . . Sí, Ramiro.  
¡Hola Francisco! (The line is dead) ¡Francisco! ¡Francisco! (He tries to get the operator)  
Señorita, isenorita! Por favor, señorita, quiero . . . (The operator tells him that she'll call him back) ¡Ah, muy bien! Gracias.  
(He hangs up and speaks to the shopkeeper) Quiero un café. No, no quiero café. Un coñac, por favor. (The phone rings)  
¡Francisco! . . . Ah, muy bien. ¿A qué hora? . . . (Francisco tells him that he'll pick him up at three) . . . Bueno . . . ¿Un Mercedes? (Turns to the shopkeeper) ¡Un Mercedes! . . .



Sí, sí muy bien, Francisco. Adiós  
y gracias. (He hangs up) Quiero  
un café.

Shopkeeper (Upset, because she has already  
prepared the brandy) ¿Un coñac o  
un café?

Ramiro ¡Un coñac!

---

### Second Scene

The priest is headed for Petra's house.

1st Man Buenas tardes, Padre.

Priest Adiós, Sebastián.

2nd Man Buenas tardes, don Baldomero.

Priest Adiós, hijo.

---

### Petra's house

Priest Buenas tardes, Petra.

Petra Buenas tardes, don Baldomero.

Priest (He looks for Ramiro) ¿Y Ramiro?

Petra Una llamada telefónica. ¿Quiere  
usted un café?

Priest No, gracias. (Referring to  
Ramiro's upcoming departure) Un  
momento difícil, ¿eh, Petra?

Petra Sí, don Baldomero.

---

The village street. Juana, Ramiro's girlfriend,  
passes by ignoring Ramiro who is talking to a friend.  
Ramiro catches up with her.

Ramiro ¡Hola, Juana!

Juana ¡Hola!

---

Petra's house

Priest Ramiro es bueno. . .

Petra Ramiro es egoísta . . .

Priest No, Petra, Ramiro no es egoísta.  
Sólo es joven.

Petra (Changes the conversation) ¿Quiere  
usted algo ahora?

Priest Sí, ahora sí.

Petra ¿Qué prefiere? ¿Anís o café?

Priest Prefiero anís. Siempre . . .

---

The village street

Juana (Tired of the same old story) Ay,  
Ramiro, siempre igual.

Ramiro Piquera es pobre. Quiero algo más.  
¡Segovia . . . Madrid!

Juana Siempre igual. Oportunidades,  
dinero . . .

Ramiro (Upset) Sí, quiero oportunidades y  
quiero dinero . . .

---

Petra's house

Priest Ramiro quiere oportunidades,  
quiere . . .

Petra Ramiro quiere dinero. Sólo quiere  
dinero, don Baldomero. Ramiro es  
egoísta.

---

The village street

Ramiro El mundo es grande, Juana.

Juana Sí, claro, el mundo es muy grande.  
(Looks at Ramiro's watch) Es la  
hora, ¿eh?

Ramiro ¿La hora? ¡Ah! Sí, la hora . . .

Juana Adiós, Ramiro. Hasta la vista.

Ramiro Hasta la vista, no. Hasta pronto.

Hasta muy pronto.

Juana Adiós, Ramiro. Buena suerte.

---

Back Home

Petra Coñac . . . y algo de comer.

Ramiro Muchas gracias, madre.

Petra El viaje a Segovia es largo.

Ramiro Bueno . . . (Kisses mother) Adiós,  
madre.

---

While waiting at the designated point, Ramiro realizes that Francisco has forgotten to pick him up. Actually, Francisco has been playing cards and drinking beer with his friends. Ramiro heads for the village shop in order to make a phone call.

Ramiro La guía de teléfonos, por favor.

Shopkeeper En la mesa.

Ramiro (looks through phone book) El  
cinco, tres, cuatro, uno. (The  
operator asks for his number) ¿Qué  
numero es éste?

Shopkeeper El tres, uno, dos.

Ramiro El tres, uno, dos, señorita.  
(pause) Francisco, aquí  
Ramiro . . . (Francisco makes  
excuses) Imposible . . . ya, ya,  
ya . . . ¡Manana! (Very irritated)  
No, no gracias. Adiós, Francisco.

---

Ramiro is now on the road outside of Piquera. A  
truck stops by the side of the road.

Driver ¿Que hay?  
Ramiro ¿Va a Segovia?  
Driver ¡Suba!

---

### Third Scene

A truck headed towards Segovia. Ramiro is having  
a conversation with the driver.

Driver ¿Es usted de Segovia?  
Ramiro (Looking for his cigarettes) No.  
No soy de Segovia.  
Driver ¿De dónde es usted?  
Ramiro Soy de Piquera.  
Driver (Surprised) ¿De Piquera? ¿Del  
pueblo?  
Ramiro Sí. ¿Un cigarrillo?

Driver Si, gracias. ¿Quiere usted fuego?  
(Pointing to his right pocket) En  
el bolsillo, en el bolsillo de la  
derecha. (The driver swerves to  
avoid an approaching car coming on  
the wrong side of the road) ¿Es  
usted inglés? (He turns to scream  
at the driver and doesn't pay  
attention to the road ahead) ¡La  
derecha, animal! ¡La derecha!

Ramiro ¡Cuidado!

Driver Gracias. (Ramiro gives him a  
light) ¿Es usted comerciante?

Ramiro No.

Driver Empleado. ¿Es usted empleado de  
oficina?

Ramiro No. Soy mecánico.

Driver ¿Mecánico? ¿Mecánico?

---

The truck approaches Segovia. They continue to talk.

Ramiro ¿De Madrid? ¿Es usted de Madrid?

Driver Sí, señor. Soy de Madrid. (Looks at his watch) Y a las doce en Madrid. A las doce en casa.

Ramiro (With envy) ¡Madrid . . . !

Driver Sí, Madrid . . . (Starts to offer him a lift) ¿Quiere usted . . . ?

Ramiro No gracias . . . Ahora no; pero . . . (The driver points towards the front of the truck)

Driver Bueno, amigo. Segovia.

---

#### Fourth Scene

A small boarding house in Segovia. There doesn't appear to be anyone around. A soccer game can be heard on the radio. Ramiro bangs his hand on the counter to get someone's attention. The owner enters.

Casiano ¿Qué quiere usted?

Ramiro Una habitación. ¿Es usted el encargado?

Casiano (Still attentive to the game)  
Barcelona, uno; Real Madrid, dos.

Ramiro Ya . . . ¿Es usted de la casa?

Casiano ¡Un gol muy bueno de Pirri! ¡Con la izquierda!

Ramiro ¿Es usted empleado de la casa?  
(Pointing to the counter) ¿De la oficina? ¿Quién es usted?

Casiano Soy Casiano. Casiano Gil.  
(Handshake)

Ramiro Mucho gusto, señor Gil pero . . .  
quiero una habitación. (Casiano looks in the register and hands him key number 12)

Casiano La doce. Uno, dos. Barcelona uno;  
Real Madrid, dos.

Ramiro ¿Cuánto es la habitación?

Casiano Cien pesetas.

Ramiro Bueno. (Ramiro heads up the stairs)

Casiano (Casiano shouts) La habitación a la derecha.

---



## Fifth Scene

At a bar in Segovia

Ramiro (To the bartender) Una cerveza,  
por favor.

Stranger ¡Hola! ¿Cómo está usted?

Ramiro Muy bien, ¿y usted?

Stranger Bien, gracias. (Ramiro sits at the  
table) ¿Y la familia . . . ?

Ramiro Bien.

Stranger ¿Que tal por Avila?

Ramiro ¿Por Avila?

Stranger Sí, claro . . . ¿no es usted de  
Avila?

Ramiro No.

Stranger Pero . . . ¿no es usted Ruíz?

Ramiro No, no soy Ruíz.

Stranger ¿Seguro?

Ramiro Hombre . . . (Perturbed)

Stranger De la familia Ruíz entonces . . .

Ramiro No. Soy Ramiro Montero.

Stranger Encantado, Ramiro.

Ramiro Mucho gusto. (Not too sure of the  
pleasure)

Stranger (Turning to Ramiro from the bar)

¿Que quiere usted?

Ramiro Nada, gracias.

Stranger ¿No quiere un tinto?

Ramiro No, ahora no.

Stranger ¿No?

Ramiro No.

Stranger Bueno, Ruiz, mucho gusto.

Ramiro El gusto es mío. (Fed up and  
leaves the bar)

---

#### Sixth Scene

En la discoteca. Ramiro puts money in the jukebox. Two young ladies move near his seat. Ramiro turns and admires one of the young ladies' legs.

Irene ¡Ah, perdon!

Ramiro Nada, nada. (Pause) Mucha gente,  
¿eh?

Irene Si, mucha . . .

Ramiro ¿Fuego . . .? (Offers Maribel, the  
other young lady, a light)

Maribel Gracias.

Ramiro Muy bueno, ¿eh? (Referring to the  
singer whose music is playing)

Irene Sí, es bueno . . . pero prefiero a  
Mari Trini. Maribel también . . .  
¿verdad, Maribel?

Maribel Sí.

Irene Las dos preferimos a Mari Trini.

Ramiro Mari Trini . . . (Acknowledging  
their statement as a request for  
him to play that singer's music,  
Ramiro moves towards the jukebox.)

Irene (To Maribel) Una camisa un poco  
exagerada, ¿no?

Maribel Sí, bastante. ¿Quién es?

Irene De Segovia no és. (Ramiro returns.  
Mari Trini's music is now playing)  
Gracias.

Maribel Gracias. Es un disco que me  
encanta.

Ramiro ¡Oh, perdón! (As he spills some of  
his drink on Maribel's books)

Maribel No importa.

Ramiro (Opens one of the books)  
Estudiantes . . .

Irene Sí.

Ramiro Segovianas, claro . . .

Irene Sí, somos de aquí.

Ramiro Yo no soy de Segovia, pero quiero trabajar aquí.

Irene ¿Mucho tiempo? (Referring to his plans to stay in Segovia)

Ramiro (Looking at Maribel with a smile)  
Depende . . . Bueno, soy Ramiro.

Irene Irene. Encantada.

Maribel Maribel. ¿Qué tal? (Two fellows walk in) ¡Al fin! ¡Hola, chicos!

Irene ¡Hola!

Un Chico ¡Hola! Vamos.

Maribel Adiós. (To Ramiro)

Irene Adiós, Ramiro.

Ramiro (Dejected) Por favor, ¿cuánto es?

---

### Seventh Scene

At the restaurant

Ramiro Usted perdone. ¿Es la hora de cerrar?

Blonde Todavía no.

Ramiro Quiero comer algo.

Blonde Tortilla, chorizo, sardinas . . .  
(Pointing to them)

Ramiro Una ración de tortilla.

Blonde ¿Para beber . . . ?

Ramiro Tinto. (They move to a table and she serves him. He takes a sip of wine) Muy bueno.

Blonde Usted no es de Segovia, ¿verdad?

Ramiro No, soy de Piquera . . . de un pueblo . . . (She interrupts)

Blonde ¡Ah, sí! ¡Piquera! . . . (Walks away to continue cleaning tables while singing)

Ramiro Mucho trabajo, ¿no?

Blonde Siempre igual. (Brings over an ashtray) ¡Que aproveche!

Ramiro Gracias. Buena . . . (Referring to the omelette)

Blonde ¿Hace mucho tiempo que está en Segovia?

Ramiro (Looking at his watch) Sólo cinco horas.

Blonde ¿Solamente? (Sits next to Ramiro)  
¿Tiene familia aquí?

Ramiro No, aquí en Segovia no.

Blonde ¿Y amigos . . . o amigas?

Ramiro Bueno . . . todavía no. (Looking  
at her with designs. She smiles.)

## References

- Abboud, V. C. (1970). A computer-assisted instruction program in the arabic writing system. Unpublished doctoral dissertation, The University of Texas, Austin.
- Abboud, V. C., & Bunderson, C. V. (1971). A computer-assisted instruction program in the Arabic writing system (Tech. Rep. No. 4). Austin: The University of Texas.
- The ABC's of CAI (4th ed.). (1979). Fresno, CA: California State University.
- Abrams, A., & Streit, L. (1986). Effectiveness of interactive video in teaching basic photography. T.H.E. Journal, 14(2), 92-96.
- Adams, E. N. (1969). Field evaluation of the German CAI lab. In W. H. Holtzman (Ed.), Computer-assisted instruction, testing, and guidance (pp. 205-215). New York: Harper and Rowe.
- Adams, E. N. (1966). Computer assisted instruction. Computers and Automation, 15, 12-13, 41-45.
- Alderman, D. L. (1978). Evaluation of the TICCIT computer-assisted instruction system in the community college. Educational Testing Service, Princeton, NJ.

- Allen, J. R. (1971). ELSE at Dartmouth: An experiment in computer-aided instruction in French. The French Review, 44(5), 902-911.
- Allen, J. R. (1972). Current trends in computer-assisted instruction. Computers and the Humanities, 7(1), 47-55.
- Anandam, K., & Kelly, D. (1981). Guided exposure to microcomputers: An interactive program (ERIC Document Reproduction Service No. ED 205 238)
- Anderson, R. C., Kulhavy, R. W., & Andre, T. (1972). Conditions under which feedback facilitates learning from programmed lessons. Journal of Educational Psychology, 63, 186-188.
- Ariza, F., Sperber, M., & Fernández-Gasalla, M. (1972). Zarabanda. Saint Paul, MN: EMC.
- Ausubel, D. P. (1963). The psychology of meaningful verbal learning. New York: Grune & Stratton.
- Ausubel, D. P., Novak, J. D., & Hanesian, H. (1978). Educational psychology: A cognitive view. New York: Holt, Rinehart & Winston.
- Barringer, C., & Gholson, B. (1979). Effects of type and combination of feedback upon conceptual learning by children: Implications for research in academic



learning. Review of Educational Research, 49, 459-478.

Barstow, D. (1979, February). Computers and education: Some questions of values. Creative Computing, pp. 116-119.

Bauer, G. R., Miller, A. E., & Henry, E. W. (1985). Implementation of a software interface with bar code data entry for an intelligent interactive videodisc instructional system. Proceedings of the International Conference of the Association for the Development of Computer-Based Instructional Systems, 126-134.

Bennett, W. J. (1984). To reclaim a legacy: A report on the humanities in higher education. National Endowment for the Humanities.

Bockman, J. F., & Gougher, R. L. (1971). Individualization of foreign language Learning in America. Educational Resources Information Center. (ERIC Document Reproduction Service No. ED 052 642)

Boen, L. (1982). CDI: It teaches. T.H.E. Journal, 10(1), 102.

Bork, A. (1982). Interaction in learning. Proceedings of the 1982 NECC. Columbia, Missouri: University of Missouri.

- Bork, A. (1983, February). Interactive instruction delivery: The new wave in education and training. Interactive Instruction Delivery in Military, Industrial and Basic Skills Training & Job Performance. Meeting of the Society for Applied Learning Technology, Orlando, FL.
- Bosco, J. J. (1984). Interactive video: Educational tool or toy? Educational Technology, 24(4), 13-19.
- Braun, L. (1980). Computers in learning environments: An imperative for the 1980's. BYTE, 5(7), 6-10, 108-114.
- Brody, P. J. (1984, April). Research on and research with interactive video. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Bunderson, C. V. (1970). The computer and instructional design. In W. H. Holtzman (Ed.), Computer-assisted instruction, testing, and guidance (pp. 45-73). New York: Harper and Row.
- Bunderson, C. V., Olsen, J. B., & Baillio, B. (1981). Proof of concept demonstration and comparative evaluation of a prototype intelligent videodisc system. Learning Design Laboratories, Orem, Utah: WICAT, Inc. (NSF SED 7900 794)

- Bush, M. D. (1983). Selected variables in the mathematical formulation of a model of second language learning. Unpublished doctoral dissertation, The Ohio State University, Columbus.
- CAI helping pupils move four grades in three years. (1977, June). Computerworld, 11, 16.
- Carroll, J. B. (1965). The contributions of psychological theory and educational research to the teaching of foreign languages. Modern Language Journal, 49(5), 273-281.
- Champagne, R. A. (1978). Responding to the challenge of survival: Multidisciplinary language courses. Foreign Language Annals, 11(1), 81-89.
- Chambers, J. A., & Sprecher, J. W. (1980). Computer assisted instruction: Current trends and critical issues. Communications of the ACM, 23(6), 332-342.
- Chastain, K. (1976). Developing second language skills: Theory to practice. Chicago: Rand McNally.
- Chen, C. H., & Cheng, C. C. (1976). Computer-assisted instruction in Chinese: An interim report. Journal of Chinese Linguistics, 4(23), 278-298.
- Clark, D. J. (1984). How do interactive videodiscs rate against other media? Instructional Innovator, 29(6), 12-16.

- Clark, R. E. (1983). Reconsidering research on learning from media. Review of Educational Research, 53(4), 445-459.
- Cohen, V. B. (1983, April). Utilizing interactive features in the design of videodisc materials. Paper presented at annual meeting of the American Educational Research Association, Montreal, Canada.
- CONDUIT. Catalog of CONDUIT reviewed and tested materials. (1979, Summer). Pipeline, pp. 13-36.
- Crotty, J. (1984). Instruction via an intelligent videodisc system versus classroom instruction for beginning college french students: A comparative experiment. Unpublished doctoral dissertation, The University of Kansas, Lawrence.
- Curland, D. (1982). Zarabanda (4th ed.). Dubuque, IA: Kendall/Hunt.
- Curtin, C., Clayton, D., Finch, C., Moor, D., & Woodruff, L. (1972). Teaching the translation of Russian by computer. The Modern Language Journal, 56(6), 354-360.
- Curtin, C., Dawson, C. L., Provenzano, N., & Cooper, P. (1976). The PLATO system: Using the Computer to teach Russian. Slavic and East European Journal, 20(3), 280-292.

- DeBloois, M. (Ed.). (1982). Videodisc/microcomputer courseware design. Englewood Cliffs, NJ: Educational Technology Publications.
- DeBloois, M. (1984). Designing instructional materials for the humanities: Is there a role for interactive videodisc technology? Computers and the Humanities, 18, 189-193.
- DeBloois, M., & Wooley, R. D. (1981). A model for developing interactive videodisc instruction (Tech. Rep. No. 3). Logan: Utah State University, Center for Instructional Product Development.
- Decker, H. W. (1976). Computer-aided instruction in French syntax. The Modern Language Journal, 60(6), 263-267.
- Deignan, G. M., & Duncan, R. E. (1978). CAI in three medical training courses: It was effective! Behavior Res. Methods and Instrumentation, 10(2), 228-230.
- Dobrian, W. A. (1977). A computerized spanish verb experiment revisited. Computers and the Humanities, 11, 163-167.
- Eastwood, L. F. (1978-1979). Motivations and deterrents to educational use of "intelligent videodisc"

systems. Journal of Educational Technology Systems,  
7(4), 303-335.

Ebner, D. G., Manning, D. T., Brooks, F. R., Mahoney,  
J. V., Lippert, H. T., & Balson, P. M. (1984).

Videodiscs can improve instructional efficiency.

Instructional Innovator, 29(6), 26-28.

Fall 1977 survey of foreign language course enrollment.

ADFL Bulletin 9(3), 186.

Ferralli, A., & Ferralli, K. (1986). Interactive

video: A tool for changing times. Media & Methods,

22(3), 10-13.

Gerlach, V. S. (1984). Trends in instructional tech-

nology research. In J. W. Brown (Ed.) Trends in

Instructional Technology, (pp. 21-29). Syracuse,

New York: ERIC Clearinghouse on Information

Resources.

Gilkey, R. W. (1986). 16mm film, videotape,

videodisc: Weighing the differences. Media & Meth-

ods, 22(4), 8-9.

Glenn, A. D., & Kehrberg, K. T. (1981). The intelli-

gent videodisc: An instructional tool for the class-

room. Educational Technology, 21(10), 60-63.

Gold, J. (1982). New partners in technology: Video

and computers. Personal Computing, 6(4), 64-70.

- Grundlehner, P. E. (1974). Computer-based education: PLATO in German. Unterrichtspraxis, 7(2), 96-105.
- Hannafin, M. J., Garhart, C., Rieber, L. P., & Phillips, T. L. (1985). Keeping interactive video in perspective. In E. E. Miller, & M. L. Mosley (Eds.), Educational Media and Technology Yearbook (Vol. 1). (pp. 13-25). Littleton, CO: Libraries Unlimited, Inc.
- Hartley, J. R., & Lovell, K. (1978). The psychological principles underlying the design of computer-based instructional systems. In J. Hartley & I. Davies (Eds.). Contributions to an educational technology. (Vol. 2). London: Kogan Page.
- Hawkins, E. (1979). The performance and promise of evaluation in computer based learning. Computers and Education, 3, 273-280.
- Helm, C. E., & McIver, C. (1974). Automated sentence analysis for language instruction. Computers and the Humanities, 8(4), 239-245.
- Hendricks, H., Bennion, J. L., & Larson, J. (1983). Technology and language learning at BYU. CALICO Journal, 1(3), 22-30, 46.
- Holtzman, W. H. (1970). Computers in education. In W. H. Holtzman (Ed.), Computer-assisted instruc-

tion, testing, and guidance (pp. 1-13). New York:  
Harper and Row.

Horwitz, E. K. (1985). Adapting communication-centered activities to student conceptual level.

Unpublished manuscript, The University of Texas at  
Austin, Foreign Language Education Center.

Howe, S. F. (1985). Interactive video: Salt & pepper  
technology. Media & Methods, 21(5), 8-20.

Hunt, D. E. (1971). Matching models in education: The  
coordination of teaching methods with student char-  
acteristics. Toronto: Ontario Institute for Studies  
in Education.

Isaac, S., & Michael, W. B. (1985). Handbook in  
research and evaluation (2nd ed.). San Diego, CA:  
Edits.

Jarvis, G. A. (1971). Individualized learning--where  
can we risk compromise? The Modern Language Jour-  
nal, 55(6), 375-378.

Javetz, E. (1986, April). Interactive video: A tool  
for developing listening comprehension in second-  
language learners. Presented at the Annual Meeting  
of the American Educational Research Association,  
San Francisco, CA.



- Jonassen, D. H. (1985). Interactive lesson designs: A taxonomy. Educational Technology, 25(6), 7-17.
- Kalbouss, G. (1976). Computer-assisted instruction in the teaching of Russian. In J. L. Conrad (Ed.), Russian language study in 1975: A status report. (ERIC Document Reproduction Service No. ED 123 889.
- Kearsley, G. P. (1977). The cost of CAI: A matter of assumption. AEDS Journal, 10(3), 100-110.
- Krashen, S. D. (1982). Principles and practice in second language acquisition. Oxford: Pergamon Press.
- Kulik, J. A. (1983). Synthesis of research on computer-based instruction. Educational Leadership, 41(1), 19-21.
- Kulik, J. A., Kulik, C., & Cohen, P. (1980). Effectiveness of computer-based college teaching: A meta-analysis of findings. Review of Educational Research, 50(4), 525-544.
- Kurtz, A. K., Walter, J. S., & Brenner, H. (1950). The effects of inserted questions and statements on film learning. State College: Pennsylvania State University. Special Devices Center.
- Lamendella, J. T. (1979). The neurofunctional basis of pattern practice. TESOL Quarterly, 13, 5-19.

- Lantolf, J. P. (1985). On the role of the computer in foreign language instruction. In S. Williams (Ed.), Humans and Machines, (pp. 221-235). Norwood, NJ: Ablex Publishing.
- Laurillard, D. M. (1977). The design and development of CAI materials in undergraduate science. Computer Graphics, 2, 241-247.
- Leonard, G. (1968). Education and ecstasy. New York: Dell.
- Leveridge, L. (1979-1980). Experience in educational design for interactive videodisc and quadrasync presentations. Journal of Educational Technology Systems, 8(3), 221-230.
- Levin, W. (1983). Interactive video: The state-of-the-art teaching machine. The Computing Teacher, 11(2), 11-17.
- Magidson, E. M. (1978). Issue overview: Trends in computer-assisted instruction. Educational Technology, 18(4), 5-8.
- Mahllos, M. C., & Bromley, K. D. (1984, January). Student and teacher bidirectional classroom behavior: Effects on classroom interaction, achievement and attitude. Paper presented at the annual meeting

of the Association of Teacher Educators, New Orleans, LA.

- Manwell, T. (1972). Research and development for interactive teaching of Russian. (Final Report). Cambridge, MA: Harvard University, National Center for Educational Research and Development. (ERIC Document Reproduction Service No. ED 082 473)
- McEwen, N. (1977). Computer-assisted instruction in second language learning: An Alberta project. The Canadian Modern Language Review, 33(3), 333-343.
- McKenzie, J., Elton, L., & Lewis, R. (1978). Interactive computer graphics in science teaching. New York: Halstead.
- McTavish, C. L. (1949). Effect of repetitive film showings on learning. (Tech Rep. No. SDC 269-7-12). State College: Pennsylvania State University. Human Engineering Branch.
- Meléndez, G. M. (1984). Interacting with a "living workbook." Foreign Language Annals, 17(6), 599-603.
- Mueller, T. H. (1971). Student attitudes in the basic French courses at the University of Kentucky. Modern Language Journal, 55, 290-298.
- Murphy, R. T., & Appel, L. R. (1977). Evaluation of the Plato IV computer-based education system in the

community college. Educational Testing Service,  
Princeton, NJ.

- Nelson, G. E., Ward, J. R., Desch, S. H., & Kaplow, R.  
(1976). Two new strategies for computer-assisted  
language instruction (CALI). Foreign Language  
Annals, 9(1), 28-37.
- O'Brien, G. W. (1975). Siren Songs and a Skeptic.  
Los Angeles, CA: International Conference on Comput-  
ers and the Humanities. (ERIC Document Reproduction  
Service No. ED 104 163)
- O'Neal, F. (1983). Waterford school and the WICAT  
Education Institute: An alternative model for CAI  
research and development. CALICO Journal, 1(1), 19-  
23, 54.
- Paden, D. W., Dalgaard, B. R., & Barr, M. D. (1977).  
A decade of computer-assisted instruction. Journal  
of Economic Education, 9(4), 14-20.
- Palmer, A. (1970). Teaching communication. Language  
Learning, 20, 55-68.
- Paulston, C. (1970). Structural pattern drills: A  
classification. Foreign Language Annals, 4(2), 187-  
193.
- Parker, W. (1984). Interactive video: Calling the  
shots. PC World, 99-108.

- Phillips, R. (1972). Drilling Spanish Verb Forms on Remote Terminals. Proceedings of the 1972 conference on computers in undergraduate curriculum. (ERIC Document Reproduction Service No. ED 066 875)
- Politzer, R. L. (1971). Toward individualization in foreign language teaching. The Modern Language Journal, 55(4), 207-212.
- Pribble, R. (1985). Enter the videodisc. Training, 22(3), 91-99.
- Primeau, J. K. (1979). The resurgence of foreign language study. The Modern Language Journal, 63(3), 117-122.
- Purcell, E. T. (1974). Computer-controlled drills for first year Russian. Slavic and East European Journal, 18(1), 56-68.
- Rivers, W. (1976). Speaking in many tongues: Essays in foreign-language teaching. (2nd ed.). Rowley, MA: Newbury House.
- Rivers, W. (Ed.). (1987). Interactive language teaching. New York: Cambridge.
- Robinson, G. L. (1978). Magic-carpet-ride-to-another-culture-syndrome. Foreign Language Annals, 11(2), 135-146.

- Robinson, G. L. (1981). Issues in second language and crosscultural education: The forest through the trees. Boston: Heinle & Heinle.
- Robinson, G. L. (1985a). Computer-assisted-language-learning and interactive videodisc: Effects on student achievement and attitudes. Unpublished manuscript. Center for Language & Crosscultural Skills, Oakland, CA.
- Robinson, G. L., Underwood, J., Rivers, W., Hernández, J., Rudesill, C., & Enseñat, C. M. (1985b). Computer-assisted-instruction in foreign language education: A comparison of the effectiveness of different methodologies and different forms of error correction (Final Report). San Francisco, CA: Center for Language and Crosscultural Skills. (ERIC Document Reproduction Service No. ED 262 626).
- Robinson, G. L. (1985c). Crosscultural understanding: Processes and approaches for foreign language, English as a second language and bilingual educators. New York: Prentice Hall.
- Rosenbaum, P. S. (1969). The computer as a learning environment for foreign language instruction. Foreign Language Annals, 2(4), 457-465.

- Rubin, J. (1984). Using the educational potential of videodisc in language learning. (Available from Joan Rubin, Joan Rubin Associates, Berkeley, CA)
- Sakamoto, T. (1978). The current state of educational technology in Japan. In A. Howe and A. J. Romiszowski (Eds.), International Yearbook of Educational and Instructional Technology 1978/1979 (pp. 251-271). New York: Nichols Publishing.
- Savignon, S. (1972). Communicative competence: An excellent experiment in foreign language teaching. Philadelphia: Center for Curriculum Development.
- Scanlan, R. T. (1971). Computer-assisted instruction in foreign languages at the University of Illinois. Foreign Language Annals, 4(4), 423-427.
- Schaeffer, R. H. (1981). Meaningful practice on the computer: Is it possible? Foreign Language Annals, 14(2), 133-137.
- Schneider, E. W. (1976). Videodiscs, or the individualization of instructional television. Educational Technology, 16(5), 53-58.
- Schneider, E. W. (1986, November). Some exploration in interactive audio. Paper presented at the Foreign Language Instructional Technology Conference, San Francisco, CA.

- Schneider, E. W., & Bennion, J. L. (1981). Videodiscs. Englewood Cliffs: Educational Technology Publications.
- Schrupp, D. M., Bush, M. D., & Mueller, G. (1983). Klavier im haus--an interactive experiment in foreign language instruction. CALICO Journal, 1(2), 17-21.
- Schulz, R. A. (1978). Back to basics in the foreign language classroom? Foreign Language Annals, 6(11), 647-655.
- Selinker, E. W., & Lamendella, J. T. (1981). Updating the interlanguage hypothesis. Studies in Second Language Acquisition, 3, 201-220.
- Sheils, M., & Cook, W. J. (1975, October 27). The dropout exam. Newsweek, p. 66.
- Sigel, E., Schubin, M., & Merrill, P. F. (1980). Video discs: The technology, the applications and the future. White Plains, NY: Knowledge Industry Publications.
- Smith, P. D. (1976). A computer-assisted instructional review of basic Spanish grammar. System, 5(3), 182-190.



- Smith, T. M., & Andrews, K. G. (1985). Computer-assisted video instruction: Promises and pitfalls. Computers in the Schools, 2(4), 65-74.
- Splittgerber, F. L. (1979). Computer-based education: A revolution in the making? Educational Technology, 19(1), 20-26.
- Steiner, F. (1971). Individualized instruction. Modern Language Journal, 55(6), 361-374.
- Stevick, E. (1976). Memory, meaning and method. Rowley, MA: Newbury House.
- Taylor, S., et al. (1974). The effectiveness of CAI. Annual Convention of the Association for Educational Data Systems. New York, NY.
- Turner, R. C. (1970). CARLOS: Computer-assisted instruction in Spanish. Hispania, 53(2), 249-252.
- Wilkins, D. A. (1976). Notional syllabuses. Oxford University Press.
- Withrow, F. B., & Roberts, L. G. (1984). The videodisc: Putting education on a silver platter. Electronic Learning, 4(2), 43-44.
- Wyatt, D. H. (1984). ESL applications of the computer-controlled videodisc player. Computers and the Humanities, 18, 243-249.

## VITA

Miguel Verano was born in Havana, Cuba, on 12 October, 1949, the son of Ligia E. Verano and Miguel A. Verano. After graduating from Cardinal Gibbons High School in Fort Lauderdale, Florida, he entered Broward Community College, and later transferred to Florida State University where, in December, 1971, he was awarded the degree of Bachelor of Arts. He joined the United States Air Force and has served his country for 15 years at various continental United States bases and at Royal Air Force Bentwaters/Woodbridge, England, United Kingdom. In 1976, he married Roberta L. Curtiss. They have a seven year old son named Sean Michael and a three year old son named William Anthony. Miguel was awarded the Master of Arts degree in Foreign Language Education from the University of Texas at Austin, in December, 1982. From January, 1983 to August, 1985, he taught Spanish at the U.S. Air Force Academy in Colorado. In 1985 he returned to the University of Texas for the purpose of obtaining a Ph.D. in Foreign Language Education.

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